ILLUSTRATED NEW MEXICO.

1883

BY W. G. RITCH.

FOURTH EDITION.


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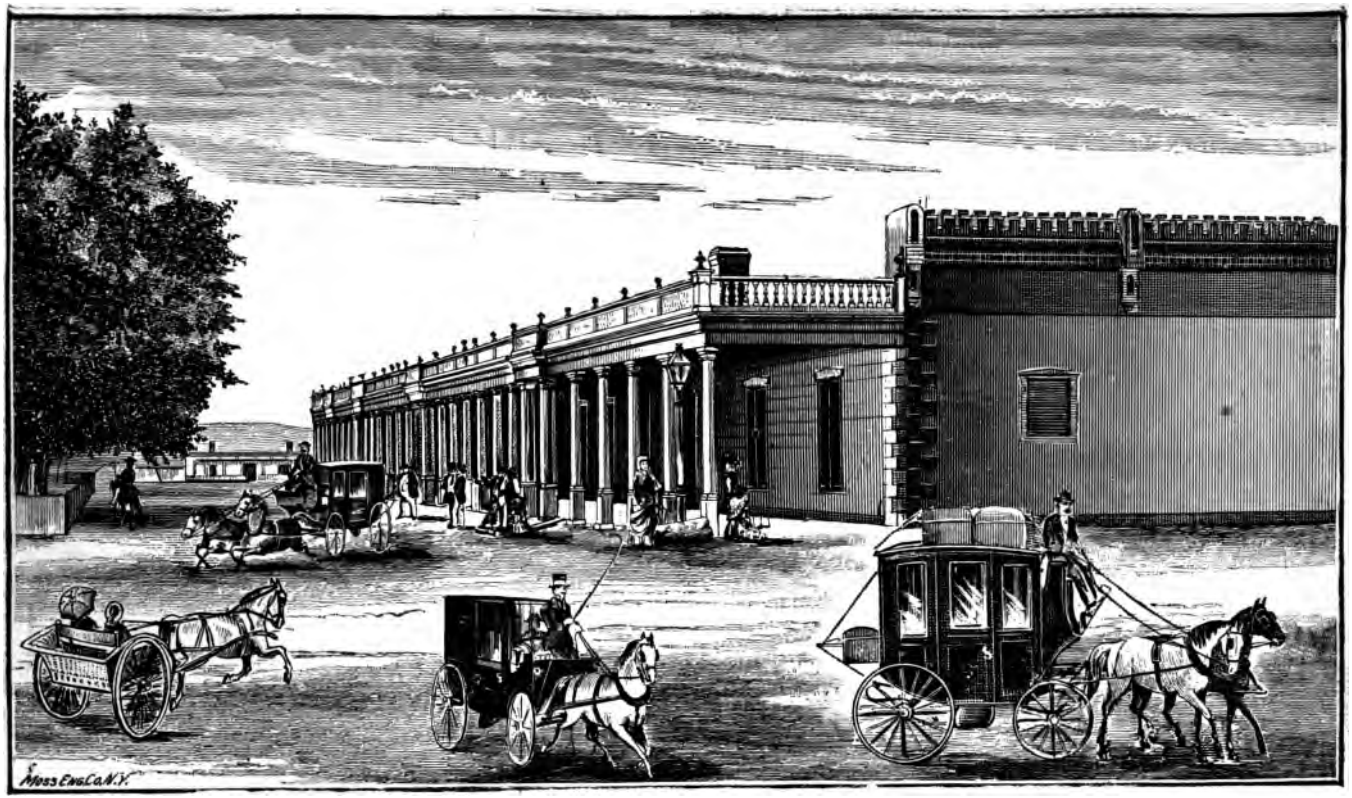


"THE ADOBE PALACE," OLD GOVERNMENT HOUSE AT SANTA FE, ERECTED 1650.

ILLUSTRATED

NEW MEXICO,

BY

HON. WILLIAM G. RITCH,

Secretary of the Territory and President of the Bureau of Immigration.

FOURTH EDITION.

SIXTEENTH THOUSAND. REVISED AND ENLARGED.

PUBLISHED BY THE BUREAU OF IMMIGRATION.
Santa Fe, New Mexico.

NEW MEXICAN PRINTING AND PUBLISHING CO.
1883.

TO THOSE IN SEARCH

OF

HEALTH, WEALTH AND HOMES,

THIS BOOK IS

RESPECTFULLY DEDICATED

BY

THE AUTHOR.

OPPORTUNITIES IN BRIEF.

The PRECIOUS METALS are found more or less in every county, and more especially in the central and southern portions of the Territory.

COAL is found in nearly every portion of the Territory, the larger fields being central and north.

STOCK ranges (government land) are open to location at outlying points toward and along the eastern and western boundaries; as also are agricultural lands. The eastern and western quarters of the Territory are wholly free from grants.

AGRICULTURAL AND HORTICULTURAL lands UNDER DITCH and partially improved can be obtained along the valleys of Central New Mexico, north and south, at from $10 to $25 per acre.

GRAPE lands are in the valleys of the central and southern portions.

VEGETABLE GARDENS and MILK and BUTTER ranches are needed in every county.

MANUFACTORIES of every character will find encouragement.

HEALTH for the afflicted everywhere, in the pure air and water, in the equitable temperature and altitude and in the medicinal hot springs.

COMFORT and pleasure at the many new and well appointed hotels.

SCENERY on natures grandest scale in all parts of the Territory.

FISHING, HUNTING and CAMP-LIFE, to satisfy the most ambitious, in the mountains and mountain parks.

ANTIQUARIANS and ARCHÆOLOGISTS can satisfy their most fastidious tastes over pre-historic ruins and the remains of the hundreds of thousands of industrial and village population of the 16th century.

RESOURCES AND ADVANTAGES IN BRIEF.

"We must pronounce the coal in question a true anthracite coal."—Dr. J. L. Leconte, on Santa Fe coals.

"Coal, apparently, is as good as the Westmoreland coal of Pennsylvania."—Gen. W. J. Palmer, Railroad surveys in New Mexico.

"As far as its practical application for all practical purposes is concerned, it is undoubtedly fully equal to Pennsylvania anthracite, and really the best fuel so far discovered in the west.—Hon. R. W. Raymond.

Referring to the coal of Colfax county Prof. Wilbur says:—

"They are by far the best that have been discovered in the Rocky mountains. They are equal to the best bituminous coals of Illinois, Ohio or Pennsylvania."

"Of the best quality for gas purposes."—Prof. Oscar Leow, on Trinidad coal, with which fields the Colfax coals are classed.

"Ten years ago the mineral wealth of New Mexico was hardly supposed to exist. It is now known to be immense, far surpassing the wealth of 'Ormus or of Ind.' "—Prof. C. D. Wilbur.

Lake Valley, one of the many valuable mining camps in New Mexico which have become as familiar as household words, will, no doubt, be

accepted, in brief, as a representative of the surpassing wealth refered to by Prof. Wilbur.

"Science as well as experience has demonstrated beyond a doubt that for consumptives the climate of New Mexico far surpasses that of Minnesota, California, or Florida."—Oscar Leow, U. S. Geological Survey, 1873.

The lowest deathrate from tubercular diseases in America is in New Mexico. Census reports of 1860 and 1870 give 25 per cent. in New England, 14 in Minnesota, from 5 to 6 in the different Southern States, and 3 per cent. in New Mexico.

"The whole Territory has always been astonishingly free from epidemic diseases."—Dr. Kennon, Santa Fe, New Mexico.

"The climate of New Mexico is mild and healthy, the sky is clear as that of Italy, and the air transparent and pure. In fact, the very act of breathing in this country makes existence in it a pleasure."—Hon. R. W. Raymond, U. S. Mining Commissioner, Report for 1871.

LANDS.—The lands of the Atlantic & Pacific railroad company can be purchased, by townships, at from fifty cents to one dollar per acre.

BUREAU OF IMMIGRATION.

LIST OF OFFICERS AND MEMBERS, 1882-1883.

OFFICERS.

W. G. RITCH, President.
MARIANO S. OTERO, Vice President.
L. SPIEGELBERG, Treasurer.
GILBERT SCUDDER, Secretary.

MEMBERS AT LARGE.

LIONEL A. SHELDON, Governor, ex-officio, Santa Fe, N. M.
MARIANO S. OTERO, Bernalillo.
WM. G. RITCH, Santa Fe.
TRINIDAD ROMERO, Las Vegas.
TRANQUILINO LUNA, Los Lunas.
LEHMAN SPIEGELBERG, Santa Fe.
CHAS. W. GREENE, Lake Valley.
NICOLAS PINO, Galisteo.
G. W. STONEROAD, Cabra Springs.

BY COUNTIES.

Bernalillo County—
WM. C. HAZELDINE, Albuquerque.

Colfax County—
THOMAS M. MICHAELS, Springer.

Dona Ana County—
ALBERT J. FOUNTAIN, Mesilla.

Grant County—
MARTIN W. BREMEN, Silver City.

Lincoln County—
JAMES J. DOLAN, Lincoln.

Mora County—
WILLIAM KROENIG, Watrous.

Rio Arriba County—
SAMUEL ELDOT, San Juan.

Santa Fe County—
ADOLF SELIGMAN, Santa Fe.

San Miguel County—
G. W. PRICHARD, Las Vegas.

Socorro County—
MICHAEL FISCHER, Socorro.

Taos County—
ALEX. GUSDORF, Fernandez de Taos.

Valencia County—
MANUEL RITO OTERO, Peralta.

MINING DISTRICTS OF NEW MEXICO,

—AND—

HOW TO REACH THEM.

Arroyo Hondo, Taos county, N. E. of Embudo, on the D. & R. G.; 30 miles.

Aztec, Rio Arriba county, S. E. of Durango, Colorado, on the D. & R. G.; 42 miles by stage.

Abiquiu, (copper), Rio Arriba, N. W. of Espanola on the D. & R. G.; 25 miles.

Alma, Socorro county, in the Mogollon District, N. W. from Silver City; stage.

Animas district, Grant county, S. W. from Engle on the A., T. & S. F. railroad.

Apache, Socorro county, N. W. of Engle, A., T. & S. F. railroad.

Amy, Socorro county, W. of Socorro, A., T. & S. F. railroad.

Bernalillo, Bernalillo county, near Bernalillo, A. T., & S. F. railroad.

Burro Mountains, Grant county, N. of Deming, (junction of A., T. & S. F. and S. P.); stage.

Bromide, Dona Ana county, N. W. of Nutt on the A., T. & S. F., 22 miles.

Black Range, Socorro county, W. of Engle on A.; T. & S. F., 40 to 80 miles; stage.

Bloomfield, Rio Arriba, 50 miles S. of Durango Col., on D. & R. G.

Blue Canon, San Miguel, — miles from Las Vegas.

Blossburg, (coal), Colfax county, W. of Raton, 5 miles on branch of A., T. & S. F. railroad.

Capitan, Lincoln county, near Lincoln.

Carrizalello, S. of Deming; 50 miles.

Caballo Mountains, W. of Rincon; 30 miles, A., T. & S. F. railroad.

Clairmont, Socorro county, in Mogollon district, N. W. from Silver City; stage.

Cooney, Socorro county in Mogollon district, N. W. from Silver City; stage.

Cooper, (copper), Santa Fe county; 20 miles N. E. Glorieta on A., T. & S. F. railroad.

Council Rock, Socorro county; 35 miles S. W. of Socorro, on A., T. & S. F, railroad.

Carbonate, Taos county; Embudo, on D. & R. G.

Copper Mountains, Taos county, N. E. Fernandez de Taos; 12 miles.

Carisillo or Stonewall, Grant county, S. of Deming; 32 miles; stage.

Central City, Grant county, N. W. of Deming; 40 miles; stage.

Cook's Peak, Grant county, 15 miles N. W. of Porter, on A., T. & S. F. railroad.

Council Rock, Datil mountains, W. of Socorro.

Coyote, Mora county, N. E. of Watrous on A., T. & S. F. railroad; 27 miles.

Carbonateville, Santa Fe county, S. of Santa Fe, and N. of Cerrillos station, A., T. & S. F. Railroad; 6 miles.

Cerrillos, Santa Fe, (coal), near Cerrillos station.

Cow Springs, Grant county, N. W. of Deming; 25 miles.

Cimarroncito, Colfax county, N. W. of Springer, A., T. & S. F. railroad; stage.

Chloride, in the Black Range; coach from Engle, N. W.

Chloride Flat, near Silver City.

Canon del Agua, Santa Fe county, 18 miles from Cerrillos station on A., T. & S. F. railroad; stage.

Carthage, (coal), Socorro, 8 miles E. of San Antonio, on branch of A., T. & S. F. railroad.

Dolores, (Old Placers, gold), Santa Fe county, S. of Cerrillos; 6 miles; stage.

Eureka, Grant county; 20 miles S. of Separ on S. P. railroad.

Elizabethtown, (gold,) Colfax county; 45 miles N. W. of Springer on A., T. & S. F. railroad; stage.

Florida Mountains, Grant county; 15 miles S. E. of Deming.

Glorieta, Grant county; Pinos Altos.

Gonzales, Santa Fe county; 20 miles S. of Santa Fe.

Gallinas, 40 miles W. of Socorro, on A., T. & S. F. railroad.

Georgetown, Grant county, 50 miles N. W. of Deming, or 54 miles N. E. of Lordsburg, on S. P.; stage.

Gillespie, near Hillsboro.

Glorieta, Santa Fe county, on A., T. & S. F., railroad.

Gallinas, Lincoln county, 68 miles E. of Socorro; stage.

Good Hope, (gold), Rio Arriba county; 30 miles N. W. of Tres Piedreas, on D. & R. G.

Golden, (gold and copper), Santa Fe county, S. of Cerrillos; 12 miles; stage.

Gold Hill, at Sulzbacher on A., T. & S. F. railroad.

Grafton, in Black Range; stage from Engle on A., T. & S. F.; northwesterly.

Hanson, Oscura mountains, E. of Socorro.

Hell Canon, Bernalillo county, S. E. of Albuquerque on A., T. & S. F. railroad; 25 miles.

Hillsboro, Dona Ana county, N. of Nutt; 25 miles; stage.

Hanover, Grant county, N. W. of Deming; 48 miles; stage.

Hungry Gulch, Santa Fe county; N. E. Cerrillos, on A., T. & S. F. railroad.

Humboldt, Socorro county, in Caballo mountains of Socorro.

Hueco, Dona Ana county, E. of Las Cruces.

Jicarrillas, Lincoln county, E. of Socorro; 88 miles; stage to White Oaks.

Jarilla, Dona Ana county, E. of Las Cruces; 42 miles; stage.

Kingston, (silver), Grant county, N. W. of Nutt on A., T. & S. F.; stage; 35 miles via Lake Valley.

Lone Pine, Santa Fe county, S. of Cerrillos on A., T. & S. F. railroad; 15 miles; stage to Golden.

Limitar, Socorro county, W. of Limitar, on A., T. & S. F. railroad; 4 miles.

Ladrones, Socorro county, W. of La Joya on A., T. & S. F. railroad; 12 miles.

Lake Valley, (silver), Dona Ana county, N. W. of Nutt on A., T. & S. F. railroad; 12 miles; stage.

Lone Mountain, Grant county, N. E. of Lordsburg on S. P.; 4 miles, or N. W. of Deming 40 miles; stage.

Lietendorf's, Grant county, S. of Lordsburg on S. P.; 7 miles; stage.

Los Animas, Dona Ana county, E. of Las Cruces.

La Joya, Socorro county, S. E. of La Joya; 20 miles; A., T. & S. F. railroad.
Manzano, Valencia county, E. of Belen; 20 miles; A., T. & S. F. railroad.
Mount Taylor, Valencia county, near Grant's; A. & P. railway.
Manchester, Lincoln county, near White Oaks.
Magdalena, Socorro, S. W. of Socorro 25 miles; stage.
Mogollon, Socorro, N. W. of Deming 90 miles; stage via Silver City.
McGregor, Taos county, N. E. from Embudo on D. & R. G.
Miembres, E. of Silver City.
Mora, Mora county, W. of Watrous; 20 miles; A., T. & S. F. railroad.
Moreno, (gold), Colfax county, N. W. of Springer on A., T. & S. F.
Mineral City, San Miguel county, near Las Vegas.
New Placers, Santa Fe county, S. of Cerrillos station; 15 miles; stage to Golden.
North San Simon, Grant county, E. of San Simon, S. P.; 2 miles.
Nogal, Lincoln county, S. E. of Socorro via White Oaks; 100 miles.
Nacimiento, (copper), Bernalillo county, W. of Bernalillo on the A., T., & S. F. railroad; 50 miles.
Oscuras, E. of Socorro; 34 to 40 miles.
Organs, Dona Ana county, E. of Las Cruces, A., T. & S. F. railroad, 18 miles; stage.
Ortiz Mills, Santa Fe county, S. of Cerrillos; 4 miles.
Pueblo, Socorro county, W. of Socorro; 30 miles; stage.
Palomas, Socorro county, S. W. of Engle on the Rio Grande.
Pecos, Santa Fe county, near Kingman, A., T. & S. F. railroad.
Petaca, Rio Arriba county, near No Agua, D. & R. G. railroad.
Picuris, Taos, N. E. of Embudo, D. &. R. G.
Pinos Altos, Grant county, N. W. of Deming; stage via Silver City.
Placitas, Bernalillo, E. of Bernalillo; 15 miles.
Percha, (silver,) Grant county, N. W. of Nutt on A., T. & S. F. railroad; stage; 35 miles.
Rio Hondo, Taos county, N. E. of Embudo, D. & R. G.
Rincon, San Miguel county, N. W. of Las Vegas; 20 miles.
Rincon, Rincon on A., T. & S. F. railroad.
Rio Bonita, Lincoln county, S. E. of Socorro.
Rio Arriba Placers, near Embudo, D. & R. G.
Rio de la Vaca, San Miguel county, near Fulton, A., T. & S. F. railroad.
Rio Grande Gold Placers, N. W. of Taos.
Rio Colorado Placers, Taos county, N. of Embudo, D. & R. G.
Robinson, in Black Range; stage from Engle, northwesterly.
Socorro, Socorro county, W. of Socorro; 3 miles.
San Andreas, Socorro county, E. of Engle, A., T. & S. F. railroad; 22 miles.
San Cristobal, San Cristobal mountains, near Crocker, A., T. & S. F. railroad.
Spiegelberg, Valencia county, E. Belen, A., T. & S. F. railroad; 22 miles.
South San Simon, Grant county, S. of San Simon, S. P.; 4 miles.
Spring Hill, Socorro county, W. of La Joya, A., T. & S. F. railroad.
Santa Rita, Grant county, N. W. of Deming; stage via Silver City.
Shakespeare, Grant county, S. of Lordsburg, S. P.; 3 miles; stage.
Silver City, Grant county, N. W. Deming; 46 miles; stage.
Silver Flat, Silver City.
Stein's Peak, N. W. of Lordsburg, S. P.; 30 miles.
Steeple Rock, Grant county, N. W. of Lordsburg, S. P.; 40 miles.
Sweepstake, San Miguel county.
San Pedro, Santa Fe county, S. of Cerrillos, A., T. & S. F. railroad; 16 miles; stage.

Sacramento, Dona Ana county, E. of Las Cruces.
Telegraph, Grant county, on the Rio Gila; stage via Silver City.
Taos, Taos county, Fernandez de Taos.
Tijeras Canon, Bernalillo, N. E. of Albuquerque; 20 miles.
Tres Hermanas, Grant county, S. of Deming; 25 miles.
Turquesa, Santa Fe county, S. of Santa Fe; 25 miles; near Cerrillos district.
Tulerosa, Dona Ana county, N. E. of Las Cruces.
Ute Creek, Colfax county, N. W. of Springer; 40 miles; coach via Cimarron.
Virginia, Grant county, S. of Lordsburg, S. P.; 10 miles; stage.
Victoria, Grant county, S. of Gage, S. P.; 4 miles.
Vera Cruz, Lincoln county, S. E. of Socorro; 80 miles; stage via White Oaks.
Vallecitos, Santa Fe county, Cerrillos; 6 miles.
Water Canon, Socorro county, S. W. of Socorro; 20 miles.
White Oaks, Lincoln county, E. of Socorro; 80 miles; stage.
White Mountain, S. W. of White Oaks; 22 miles.

STATIONS AND DISTANCES

UPON

NEW MEXICO RAILROADS.

(Telegraph Stations are indicated by a *.)

SUMMARY OF MILEAGE.

NEW MEXICO AND SOUTHERN PACIFIC.

Main line from Colorado line to Deming	481	
Santa Fe and El Paso Branches	95	
Branches to Las Vegas Hot Springs and Coal Fields at Raton and San Antonio	18	
		594

ATLANTIC AND PACIFIC.

Albuquerque to Arizona line		174

SOUTHERN PACIFIC.

El Paso to Lordsburg		182

DENVER AND RIO GRANDE.

Espanola to Antonito	79	
Antonito to Amargo	85	
		164
Total miles of railroads in the Territory December 1, 1882		1114

NEW MEXICO AND SOUTHERN PACIFIC RAILROAD.

(Under lease to Atchison Topeka & Santa Fe Railroad.)

Distance from Kansas City.	Distance from Deming.	TO	Distance from Santa Fe.	Distance between Stations.
	1149	Kansas City, Mo	869	
	1133	Atchison, Kan	853	
67	1082	Topeka*, (Kansas State Capital.)	802	66.5
201	948	Newton*	667	134.6
286	863	Great Bend*, (Arkansas River.)	582	85.
369	780	Dodge City*, (near Ft. Dodge.)	499	83.
486	662	State Line of Kansas and Colorado	381	118.1

NEW MEXICO AND SOUTHERN PACIFIC RAILROAD.—Continued.

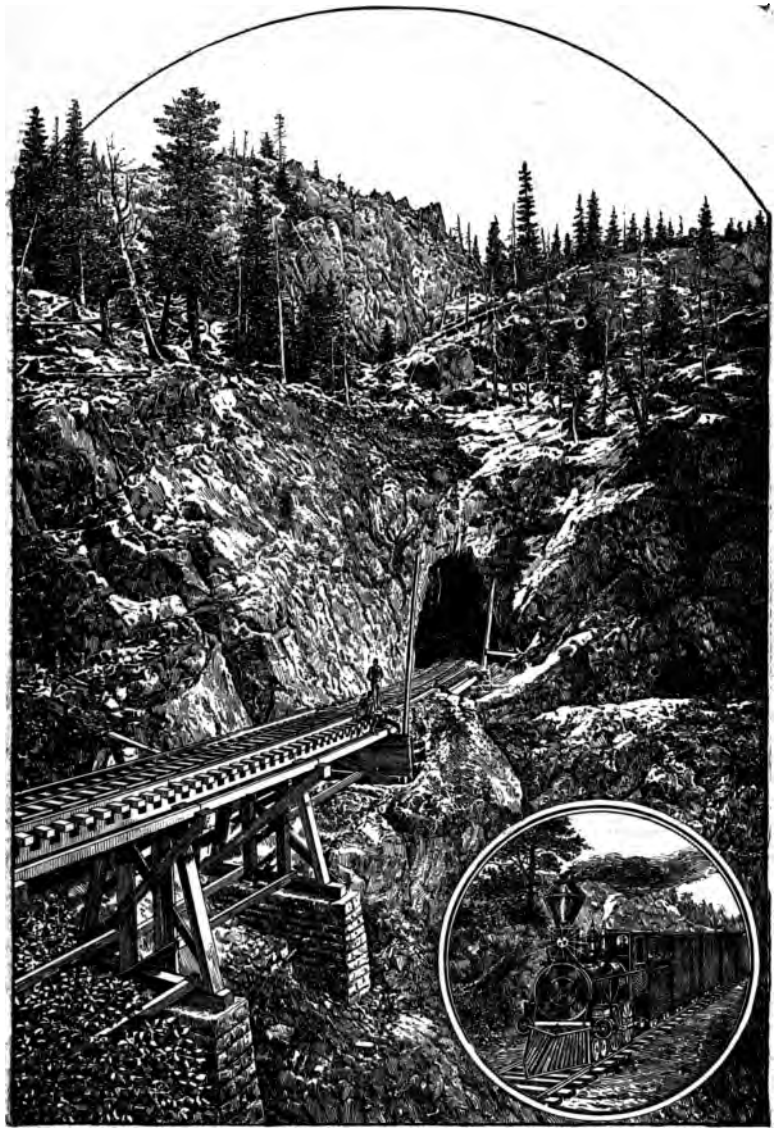
Distance from Kansas City.	Distance from Deming.	TO	Distance from Santa Fe.	Distance between Stations.
548	601	Las Animas,* (Ft. Lyon U. S. Military Post)	320	61.3
571	578	La Junta, Colo.* (Junc. for Pueblo & Denver	397	23.
652	497	Trinidad*	216	81.5
668	481	New Mexico and Colorado boundary (Tunnel)	210	15.5
675	474	Raton* (Colfax Co. and coal fields, eating station)	194	7.5
681	468	Otero, (cattle range)	189	5.3
692	457	Maxwell, "	176	11.1
702	447	Dorsey, "	167	10.2
709	440	Dover "	159	7.3
716	433	Springer,* Co. seat; (sta. for Cimarron & Elizabetht'n)	153	6.5
726	423	Ocate, (Mora county)	143	10.3
736	413	Evans	133	9.7
741	408	Wagon Mound,* (scene of Indian massacre, 1854)	128	5.5
751	398	Tipton, (Rio Mora valley)	118	10.
758	391	Shoemaker, (horticulture)	111	7.
766	383	Watrous,* (sta. for Mora, Tiptonville and Ft. Union)	103	7-9
775	374	Onava, (San Miguel Co)	94	9.1
786	363	Las Vegas,* (Co. seat. Hot Springs)	83	10.9
791	358	Romero, (stone quarries)	78	4.8
799	350	Sulzbacher	70	8.2
805	344	Bernal, (Bernal Peak)	64	5.9
815	334	Pecos, (Rio Pecos crossing)	54	10.2
823	326	Fulton, (Pecos valley)	46	7.7
832	317	Kingman,* (East of Pecos ruins, Santa Fe Co)	37	9.
837	313	Levy, (timber)	33	4.6
841	308	Glorietta,* (Union victory—battle 1862)	28	4.7
849	300	Manzanares, (valley of the Rio Galisteo)	20	8.1
851	298	Lamy,* (Junction for Santa Fe)	18	1.8
860	316	Santa Fe,* (Capital and county seat)	—	—
862	291	Ortiz	29	11.4
870	279	Cerrillos;* (coal fields; sta. for Golden; mines)	36	7.4
872	277	Waldo	38	2.
876	273	Rosario	42	6.3
881	268	Wallace,* (Bernalillo Co; Ind. pueblo; R. G. valley)	48	5.2
888	261	Elota	55	6.7
892	257	Algodones, (Vini culture)	59	4.4
903	246	Bernalillo,* (Co. seat; station for Jemez springs)	69	10.3
910	239	Alameda, (fine agricultural valley)	77	7.5
918	231	Albuquerque,* (A. & P. shops; broad valley)	85	7.9
928	221	Isleta, (pueblo; Valencia Co. R. R. bridge)	95	9.5
931	218	A. & P. Junction,*	98	3.2
938	211	Los Lunas, (Co. seat; fine farms)	105	7.5
948	201	Belen,* (broad agricultural bottoms)	115	10.
958	191	Sabinal, (Socorro county)	125	10.
969	180	La Joya	136	11.
981	168	Alamillo, (rich bottom lands)	147	11.4
994	155	Socorro,* (Co. seat; sta. for Magdalena & Oscura mts)	160	12.9
1007	142	San Antonio, (branch R.R. to coal fields)	174	12.6
1014	135	Valverde, (battle field—1862)	181	6.9
1021	128	San Marcial,* (sta. for Ojo Caliente)	188	6.6
1028	121	Pope	195	7.4
1037	112	Lava	204	9.2

NEW MEXICO AND SOUTHERN PACIFIC—Continued.

Distance from Kansas City.	Distance from Deming.	TO	Distance from Santa Fe.	Distance between Stations.
1047	102	Crocker, (stock range)	214	10.
1059	90	Engle* (Sta. for Black Range Mines)	226	11.7
1067	82	Cutter, (stock range)	234	8.
1079	70	Upham, (stock range)	246	12.
1090	60	Grama, (stock range)	256	10.4
1097	53	Rincon* (Jnc. for Las Cruces, Dona Ana Co., El Paso)	263	6.9
1101	48	Hatch, (Rio Grande crossing)	267	4.4
1110	39	Sellers, (stock range)	276	8.9
1117	32	Watson	284	7.5
1121	28	Nutt* (Sta. for Lake Valley, Percha and Hillsboro)	288	3.9
1134	15	Florida,	301	13.
1142	7	Coleman (Grant Co.)	309	7.6
1149		Deming* (S. P. Junction. Sta. for Silver City)	316	7.3

EL PASO BRANCH.

Distance from Kansas City.	Distance from El Paso.	FROM	Distance from Santa Fe.	Distance between Stations.
1097	77	Rincon*	263	
1105	69	Tonuco	271	8.0
1113	60	Randall	279	8.5
1116	58	Selden* (Ft. Selden, U. S. military post)	282	2.6
1125	49	Dona Ana, (broad, rich bottom lands)	291	8.6
1131	44	Las Cruces* (Co. Seat. Sta. for Mesilla, grape lands)	297	5.5
1142	32	Mesquite, (Mesilla valley)	308	11.4
1155	20	Anthony, (agricultural lands)	321	12.5
1164	11	Montoya	330	8.9
1175		El Paso. (Texas)* (Junc'n T. P., and for Chihuahua)	340	10.8



TOLTEC TUNNEL, EAST ENTRACE D. & R. G. R. R.

ATLANTIC AND PACIFIC RAILROAD.
(New Mexico Division.)

Distance from Albuquerque	From Santa Fe (by rail over New Mexico and Southern Pacific). TO	Distance from Santa Fe.	Distance between Stations
	Albuquerque* (Initial Point and Shops)	85	
9.6	Isleta (Indian Pueblo)	95	9.6
12.7	A. & P. Junction*	98	3.1
23.4	Luna	109	10.7
34.	Rio Puerco (Rio Puerco Bridge, stock range)	119	10.6
47.2	San Jose (Coal)	132	13.2
59.8	El Rito	145	12.6
66.	Laguna* (Indian Pueblo, Presbyterian mission)	151	6.2
72.	Cubero (Sta. for Cubero and Acoma Pueblos)	157	6.
83.4	McCarty's, (stock)	168	11.4
88.	Acoma	173	4.6
96.1	Grants* (Old Ft. Wingate, stock)	181	8.1
107.2	Blue Water, (stock range)	192	11.1
121.8	Chavez	207	14.6
130.2	Continental Divide, (timber)	215	8.4
136.1	Coolidge* (Bacon Springs)	221	5.9
146.2	Wingate* (U. S. Military Post, coal oil)	231	10.1
157.7	Gallup, (coal)	242	11.5
165.6	Defiance, (Sta. for Navajo Agency)	250	7.9
174.	Manuelito (near Arizona Boundary)	258	8.4
186.9	Allantown	273	12.9
199.7	Sanders	286	12.8
212.7	Navajo Springs	299	13.
215.3	Billings	312	12.6
238.1	Carrizo	323	12.8
250.9	Holbrook	336	12.8
263.1	St. Joseph	348	12.2
277.	Breeds (Sta. for Moqui Pueblo)	367	13.9
285.5	Winslow*	378	8.5

DENVER AND RIO GRANDE RAILWAY.
(New Mexico Division.)

Distance from Denver.	From Santa Fe Northerly TO	Distance from Santa Fe.	Distance between Stations.
379	Espanola* (Broad agricultural valley)	28.	
365	Chamita, (Opposite San Juan Pueblo, agriculture)	39.8	4.8
358	Alcade, (agriculture)	37.1	6.3
351	Embudo* (Sta. for Taos, Rio Grande bridge)	45.1	8.
343	Comanche	49.6	4.5
346	Barranca* (Sta. for Joseph's Ojo Caliente)	52.6	3.
336	Caliente, (timber)	59.6	7.
324	Servilleta	62.5	12.9
314	Tres Piedras* (timber)	72.5	10.
306	No Agua	79.6	7.1

DENVER AND RIO GRANDE RAILWAY—Continued.

Distance from Denver.	TO	Distance from Santa Fe.	Distance between Stations.
297	Volcano, (stock range)	88.7	9.1
290	Palmilla	95.7	7.
279	Antonito* (Junction for the West)	107.2	11.5
250	Alamosa* (San Louis Valley)	135.9	28.7
226	Fort Garland* (U. S. Military Post)	159.9	24.
206	Veta Pass* (Mule Shoe Bend)	180.4	20.5
170	Cuchara*	217.5	36.1
120	South Pueblo* (Junction for Leadville)	266.	49.5
75	Colorado Springs* (Colorado College)	310.4	44.4
	Denver* (State Capital of Colorado)	338.	75.2
	SAN JUAN DIVISION.		
289	Lava	117.4	10.2
298	Bighorn	126.4	9.
304	Sublette* (timber)	132.	5.6
309	Toltec (Gorge and Tunnel)	137.3	5.3
317	Osier*	145.3	8.
321	Los Pinos, (coal)	149.1	3.8
329	Cumbreo*	157.4	8.3
331	Coxo	159.2	1.8
338	Lobato, (timber)	166.9	7.7
343	Chama* (Sta. for Tierra Amarilla, agricultural valley)	171.1	4.2
348	Willow Creek	176.1	5.
353	Azotea	180.9	4.8
362	Monero	190.1	9.2
365	Amargo* (Jicarrilla Indian Res)	193.7	3.6
402	Arboles*	230.4	36.7
425	Ignacio*	253.	22.6
450	Durango*	278.8	25.8

SOUTHERN PACIFIC.
(New Mexico.)

Distance from San Francisco.	From Santa Fe via N. M. and Southern Pacific TO	Distance from Santa Fe.	Distance between Stations.
1286	El Paso* (Texas, Rio Grande valley)	340	
1271	Strauss, (stock range)		15
1198	Deming* (Junction A., T. & S. F. and to Silver City)	310	73
1178	Gage, (stock range)	330	20
1138	Lordsburg* (Mines, station for Shakspeare and Clifton)	370	40
1104	San Simon* (Mines)	410	34
1164	Wilcox*	450	40
1024	Benson* (Junction for Guaymas)	460	40
978	Tucson*	536	46
913	Casa Grande*	691	65

SOUTHERN PACIFIC—Continued.

Distance from San Francisco.	From Santa Fe via N. M. and Southern Pacific TO	Distance from Santa Fe.	Distance between Stations.
731	Yuma*	783	162
482	Los Angelos*	1032	248
241	Goshen*	1278	241
	San Francisco	1514	241
	Via Rincon and Rio Grande Valley to		
1286	El Paso, Texas*	840	
	From hence southerly via Galveston, Harrisburg and San Antonio Railroad to		
	Distance from El Paso		
12	Ysleta (Indian Pueblo, Texas)	352	12
21	San Eizario	361	9
53	Camp Rice	393	32

NEW MEXICO.

ITS RESOURCES AND ADVANTAGES.

Looking for Montezuma.

THE TERRITORY OF NEW MEXICO is anomalous in that it is the seat of the antipodes of civilization upon the continent.

The "free for all chance" in the race of modern energy, enterprise and prosperity, with the coming of steam transportation in its mighty irresistible onward course, has here peaceably met face to face mediæval conservatism and the crooked stick plows and industrial methods of the Ptolomies.

Here, are not only found the descendants and representatives of the old Latin civilization, but likewise the old Mexican or Native races still living in domestic simplicity and peacefulness, tilling the soil and hunting the buffalo in season and dwelling in permanent homes and communal houses erected of sun-dried brick and stone, closely clustered around a common plaza, and all much the same, as will be recognized, as when visited and

DESCRIBED BY ANTONIO DE ESPEJO, THREE CENTURIES AGO.

Espejo says: "From Conches, situated on the western border of Texas, (probably centering around where the river of the same name, on modern maps, debouches into the Rio Grande), they followed their journey for the space of fifteen days without meeting any people, all that while passing through wood and groves of pine trees (pinon) bearing such fruit as those of Castile. At the end, whereof, having traveled, to their judgement, fourscore leagues, they came unto a small hamlet or village (pueblos at or near Paso del Norte, or San Elizario) of few people, in whose poor cottages covered with straw they found many deer-skins as well dressed as those of Flanders, with

great store of excellent white salt. They gave our men good entertainment for the space of two days while they remained there, after which they bare them company about twelve leagues, into certian great towns, always traveling by the river called the Rio del Norte abovesaid, till such time as they came into the country called by them New Mexico. Here all along the shore of the said river grew mighty woods of poplar, being in some places four leagues broad, and great store of walnut trees and vines like those of Castile.

"Having traveled two days through the said woods of poplar and walnut trees, they came to ten towns situated on both sides of the said river, besides others which they might see further out of the way, wherein there seemed to be great store of people, and those which they saw were above ten thousand persons. In this province the people received them very courteously and brought them to their towns, whereas they gave them great plenty of vituals and hens of the country, with many other things, and that with good will. Here they found houses very well built, with gallant lodgings, and in most of them were stoves for the winter season. Their garments were of cotton and of deer-skins, and the attire both of men and women is after the manner of the Indians of the kingdom of Mexico. But the strangest thing of all was to see both men and women wear shoes and boots with good soles of neats leather, a thing which they never saw in any other part of Mexico. The women keep their hair well combed and dressed, wearing nothing else upon their heads. In all these towns they had Caciques who governed their people like the Caciques of Mexico, with sergeants to execute their commands, who go through the town proclaiming with a loud voice the pleasure of the Caciques, commanding the same to be put in execution.

"In all their arable grounds, whereof they have great plenty, they erect on the one side a little cottage or shed standing upon four studs, under which the laborers do eat and pass away the heat of the day, for they are a people given to labor, and do continually occupy themselve therein. The weapons that they use are strong bows and arrows headed with flints, which will pierce through a coat of mail, and macanas which are clubs of half a yard long so set with sharp flints that they are sufficient to cleave a man asunder in the midst; they use also a kind of targets made of raw hides."

Espejo also records coming to the province of "Tiguez containing sixteen towns," one of which was named "Poala." (The latter, now an extinct pueblo, is understood to have been situate upon the Rio Grande between the towns of Albuquerque and

Bernalillo.) He likewise visited the province of Quires (Santo Domingo and vicinity) having 14,000 souls, of Cia (Zia) having 20,000, "and containing eight market places and better houses, the latter plastered and painted in divers colors," who "presented our men with many curious mantles, and victuals, excellently well dressed." Zia was "deemed more curious, of greater civility and better government than any other pueblo hitherto seen. "Ameies (Jemez) with 30,000 population, was next visited, and which, "like unto their neighbors of the former province, (Zia) being as well provided of all necessaries as they, and of as good government," and then Acoma, "situate upon a high rock and reached by steps cut in the rocks," and having a population of 6,000 persons. He also visited Zuñi, and another great province further west containing 50,000 population. Espejo speaks frequently of their houses and of some that were four stories high, and generally writes approvingly of their cultivation of the soil, and the great industry and provident care of the people, and of their generous hospitality, to the extent of feeding and caring for his whole command for days.

PUEBLO INDIAN COMMUNITY HOUSE—TAOS.

The account of Captain Espejo proves very clearly that the Pueblo Indian in his native civilization of 1583 like the Pueblo Indian of 1883 was within the borders of civilization, in fact, if not ranked as such. These people, as a distinct race, now number about 10,000 residing in this Territory. Originaly, according to Spanish writers, they numbered among the hundreds of thou-

sands. After the revolution of 1680 numbers of them emigrated to the Pacific slope; some joined the wild tribes and others became merged into the civilization of their conquerors, and now generally known on this continent as Mexican. Of the masses of the people of the Territory, mention will be made further on.

LIFE AND PROPERTY SECURE.

When people contemplate emigrating to any particular locality, the first and most important inquiry is whether life and property are secure. In all ages and countries history shows that the bad element floats with the tide of emigration in a percentage larger than that which remains in the old and organized communities. New Mexico has not been an exception to this rule. The geographical position and isolation from the States by reason of a want of railroad communications have hitherto caused bad men from other localities to congregate within her borders, who, with the warlike Apaches, have given the people a great deal of trouble and have inflicted upon the Territory very serious injuries. While in the past hostile Indians have made frequent raids upon outlying settlements; murders and robberies by white men have been numerous. Since October, 1881, hostiles have not made a demonstration in New Mexico, and "rustlers" and desperadoes have scarcely put in an appearance.

It is a fact neither well known nor appreciated, that at no time within the past generation has their existed in any material sense at Santa Fe, Albuquerque and Las Vegas, any greater danger from attack by Indians than at San Francisco, Chicago or Boston. The same is, and has been true with respect to nearly every town of prominence during the past ten years; and to-day, is barely less true of every settlement in the Territory.

The courts are in the vigorous and faithful discharge of their duties, and criminals are arrested, convicted and punished as successfully as can be expected in a country so large and sparsely populated, and where mountains and cañons afford such facilities for escape and concealment.

Twenty militia companies are organized, armed, supplied with ammunition, and well officered, and so located as to promptly and effectively protect the people in nearly every part of the Territory. Composed as they are of men interested in the country, they are reliable and efficient, and their presence tends to deter bad men from acts of violence and crime. The Territory is commendably peaceable and orderly, and people who desire to come here are confidently assured that they will be safe in their lives, property and business.

The means of transportation to and within New Mexico are furnished by the following constructed and contemplated railways:

COLLOSSUS OF ROADS.

RAILWAYS.

The Atchison, Topeka and Santa Fe railroad starting from Kansas City has been completed to Deming on the Southern Pacific, and on southwesterly across the State of Sonora to Guaymas, a port on the Pacfic coast in the republic of Mexico. At Rincon it has a track following the Rio Grande to El Paso, in the State of Texas, where it connects with the Mexican Central railroad, now completed from Paso del Norte to the city of Chihuahua, and having the city of Mexico as an objective point.

The general direction of the road from the Colorado State line at Raton Pass to Rincon Junction is nearly south. From

Rincon Junction to Deming its direction is southwesterly, and to the Texas State line south southeast. Connection is made with Santa Fe by an eighteen mile branch from Lamy Junction.

Branches to the coal beds adjacent have been constructed from Raton and San Antonio respectively.

A branch to the Las Vegas Hot Springs has likewise been constructed, which makes close connections with all passenger trains.

Other branches from the main line have been projected to connect with various outlying points, and which are either in course of construction or will be constructed in the early future. The length of line constructed in New Mexico belonging to the A., T. & S. F., system of railways, is 594 miles.

The Atlantic and Pacific railroad, (New Mexico division) beginning at Albuquerque on the Rio Grande, extends in a westerly direction to the western boundary of New Mexico, and into central Arizona. It has the city of San Francisco, in the State of California, as its objective point.

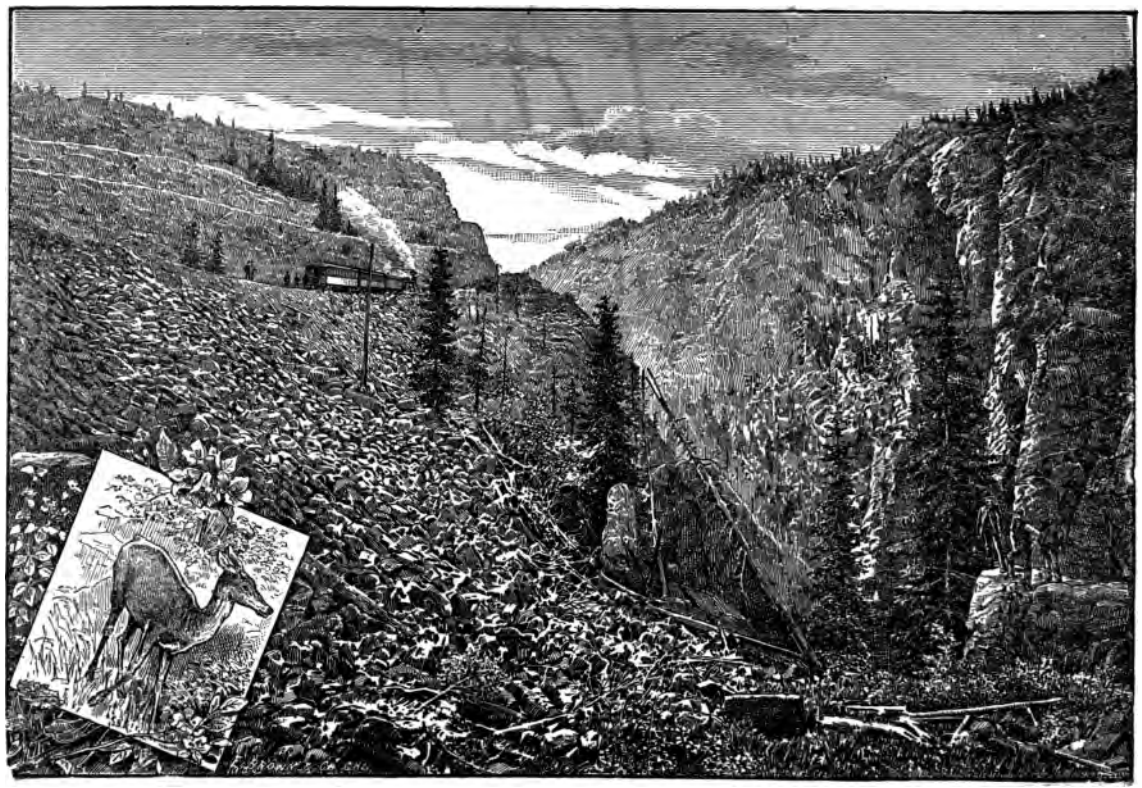
The Denver and Rio Grande railroad enters the Territory from the north near Antonito. Of the San Juan division of said road, running west, there are about 60 miles of track in this Territory. The New Mexico division of that road extends from near Antonito to Espanola, 28 miles north of the city of Santa Fe, running nearly due south with 80 miles of track. Connection by daily concord coaches are made with Santa Fe.

The Southern Pacific railroad extends entirely across the southwestern portion of the Territory, running almost due east from Stein's Pass, where it enters the Territory and connects at Deming with the A., T. & S. F., system and at El Paso with the Texas Pacific; it has 155 miles of track.

The Texas Pacific railroad, which is now completed to El-Paso, Texas, has continuous railway connection through the State of Arkansas to St. Louis, and through Texas and Louisiana to Galveston and New Orleans.

The Texas, Santa Fe and Northern railroad connects with the Denver and Rio Grande railroad at Espanola and runs southeasterly to the city of Santa Fe. The building of the road to the latter point is well under way; from thence it is projected to the Pecos river and to Galveston and other gulf ports and to Laredo, thence to connect with the Mexican National railway. The Denver and New Orleans railway gives promise of building its line through eastern New Mexico.

Roads are also projected and chartered from Trinidad, in the State of Colorado, to Las Vegas and the Rio Grande, and



TOLTEC GORGE, WEST OF THE TUNNEL, D. & R. G. RY., RIO ARRIBA CO.

from Socorro, on the Atchison, Topeka and Santa Fe railroad to the Black Range and the Mogollon mining camps.

The Gulf, Colorado and Santa Fe railroad is in course of construction from Galveston, and is expected to reach the city of Santa Fe in eighteen months.

The Atlantic and Pacific railroad, from the Indian Territory west, will doubtless be built, and will strike the eastern boundary of the Territory near the Canadian river, and Albuquerque, on the Rio Grande.

Companies have been organized to construct roads respectively, from Deming to Silver City, (ready for the iron,) from Lordsburg to Clifton, Arizona, and from Nutt station to Lake Valley. [See tables of railway stations and distances among first pages of this book.]

THE OVERLAND TRADE

amounted in 1831 to $15,000; in 1846 to $1,752,250, and in 1876 to $2,108,000. This trade has increased to a great extent, supplying now sufficient freight for four railroads, and will doubtless increase so as to render projected railroad enterprises profitable.

AREA AND BOUNDARIES.

The Territory has an average breadth of 335 miles; length of eastern boundary, 345 miles; length of western boundary, 390 miles; the whole covering an area of 121,201 square miles. By geographical divisions it is bounded on the north by the State of Colorado, on the east by the public domain and the State of Texas, on the south by the State of Texas and the Mexican States of Chihuahua and Sonora, and on the west by the Territory of Arizona.

The Territory is divided into twelve counties, as follows:

NORTHERN TIER.

Colfax, with Springer as county seat.
Taos, with Fernando de Taos as county seat.
Rio Arriba, with Tierra Amarilla as county seat.

CENTRAL TIER.

Mora, with Mora as county seat.
San Miguel, with Las Vegas as county seat.
Santa Fe, with Santa Fe as county seat.
Bernalillo, with Bernalillo as county seat.
Valencia, with Los Lunas as county seat.
Socorro, with Socorro as county seat.

SOUTHERN TIER.

Lincoln, with Lincoln as county seat.
Doña Ana, with Las Cruces as county seat.
Grant, with Silver City as county seat.

SCENES IN ALBUQUERQUE.

BUSINESS CENTERS.

Santa Fe is the capital of the Territory and military headquarters and a commercial, educational, religious and political center. Albuquerque, Las Vegas and Silver City have been and still are developing very rapidly, and are each bidding stoutly for commercial supremacy. The following are enterprising and growing towns: Socorro, Georgetown, Las Cruces, La Mesilla, Springer, Raton, Los Lunas, Mora, Tierra Amarilla, Lincoln, White Oaks, Taos, Watrous, Cerrillos, Deming, Lordsburg, Lake Valley, Hillsboro and Kingston. All are either on railroads or stage routes. They vary in population from a few hundred in the last named to several thousand in the first named.

The population of the Territory, with the recent increase, may be set down at 130,000, or a fraction above one person to the square mile.

THE PEOPLE.

The masses of the people are simple in their tastes and habits, peaceable and law-abiding. Village settlements are the rule, this mode of living having been necessary, under past experience, as a means of protection against hostile Indians. They are generally engaged in agriculture on a small scale, and in

attending to herds and flocks. In a few instances agriculture is carried on quite extensively, and the flocks of sheep and herds of cattle are very large. The people engaged in the mining industry are generally those who have come to the Teritory recently.

The people of New Mexico have frequently given substantial evidence that they are a well-disposed, patriotic, and liberty-loving people.

In illustration of their love of liberty and friendship for the government, the following instances are mentioned:

General Kearny occupied the country in 1846 without meeting an armed force or material opposition of any kind, although a few months later, under gross misrepresentations by a few restless spirits, a speck of war was developed, which, however, was easily suppressed.

In the convention, called in October, 1848, to consider questions with respect to local self-government, the convention adopted unanimously a petition and resolutions, among which were the following as translated:

We, the people of New Mexico, respectfully petition Congress for the speedy organization by law of a Territorial civil government for us.

Then a resolution:

We do not desire to have domestic slavery within our borders, and until the time shall arrive for an admission into the Union as a State, we desire to be protected by Congress against their introduction amongst us.

The resolutions have the more force when it is remembered that the best citizens of the Territory were elected to and served in that convention, and that more than two-thirds of the members were born in the Territory.

From 1848 to 1860 militia and volunteers of the Territory, under the command of native officers, were engaged in several successful Indian campaigns, n tably 1854 and 1859.

In the same spirit and from like motives the Territory contributed to the Union armies over 6,000 volunteers during the war of the rebellion, who performed arduous, gallant and effective service against rebels and hostile Indians, and notably at Apache cañon, where the confederate troops were so completely discomfited that they at once abandoned the Territory.

Thus at their homes, in legislation, and in the army have the people given evidence of their love of liberty and fealty to the government placed over them by conquest.

The native population are not only law-abiding themselves, but are a reliable element to be employed in repelling Indian raids and suppressing domestic disorders; they are seldom guilty of heinous crimes. Most of the desperadoes who have hereto-

fore infested the Territory, where adventurers from other localities.

IMMIGRATION.

Immigration, since the advent of railroads, has been and now is rapidly on the increase. More than 10,000 people have come to the Territory for permanent settlement since the census of 1880. They are from every State and Territory in the Union, and a few from many of the foreign nations. As a body they are, like the mass of those who came here from 1846 to 1880, intelligent, patriotic, energetic, economical, honest and orderly.

The following table shows the distribution and locality of population according to the census of 1880.

NEW MEXICO.

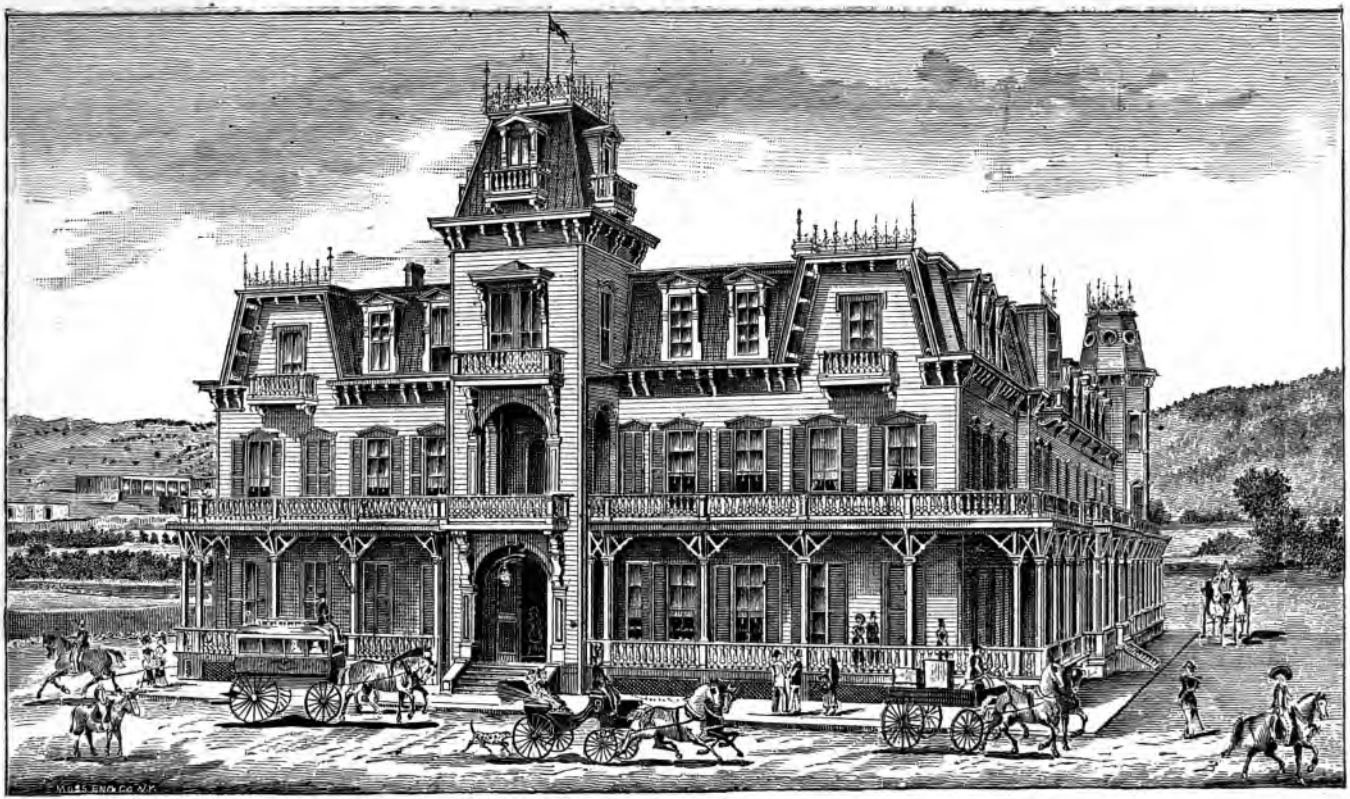
COUNTIES.	Total.	Male	Female	Native.	Foreign.	White.	Colored.*
The Territory.	119,565	64,496	55,069	111,514	8,051	108,721	10,844
Bernalillo.....	17,225	9,087	8,183	16,842	383	12,514	4,711
Colfax.....	3,398	1,973	1,425	3,144	254	3,375	23
Dona Ana.....	7,612	3,958	3,654	4,743	2,869	7,537	75
Grant.....	4,539	2,844	1,695	2,536	2,003	4,404	135
Lincoln.....	2,513	1,552	961	2,303	210	2,448	65
Mora.....	9,751	5,033	4,718	9,542	209	9,423	328
Rio Arriba.....	11,023	5,735	5,288	10,837	186	10,215	808
San Miguel.....	20,638	11,048	9,590	20,061	577	20,439	199
Santa Fe.....	10,867	6,023	4,844	10,209	658	18,388	479
Socorro.....	7,875	4,280	3,595	7,506	369	7,804	71
Taos.....	11,029	6,021	5,008	10,872	157	10,401	628
Valencia.....	13,095	6,942	6,153	12,919	176	9,773	3,322

*Including in the Territory, 56 Chinese and 9,790 Indians and half-breeds; in Bernalillo county, 2 Chinese and 4,492 Indians and half-breeds; in Colfax county, 17 Indians and half-breeds; in Dona Ana county, 5 Chinese and 45 Indians and half-breeds; in Grant county, 40 Chinese and 9 Indians; in Lincoln county, 2 Chinese and 3 Indians, in Mora county, 86 Indians and half-breeds; in Rio Arriba county, 799 Indians and half-breeds; in San Miguel county, 5 Chinese and 96 Indians and half-breeds; in Santa Fe county, 2 Chinese and 359 Indians and half-breeds; in Taos county, 583 Indians and half-breeds; in Valencia county, 3,301 Indians and half-breeds.

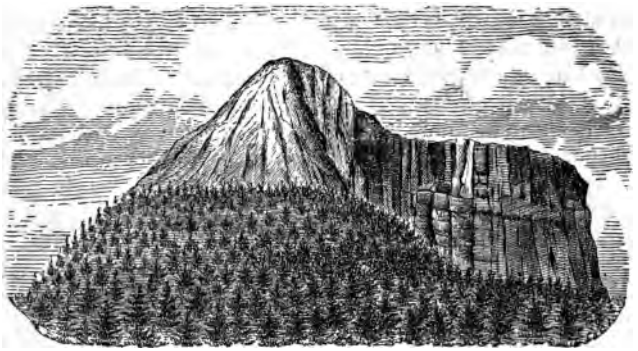
FACE OF THE COUNTRY.

The surface is marked with mesas, valleys and mountains, foot-hills, bluffs, cañons and mountain parks. The mountain ranges, from north to south generally, break into spurs, buttes and foot-hills, diminishing in altitude, and graduating into mesas or high table lands.

In the northern part of the Territory the Culebra range looms up to the east into the Raton spur, and to the south is



PALACE HOTEL, SANTA FE.



ABOVE THE TIMBER LINE.

known, according to proximity to local towns, as Taos, Mora and Santa Fe mountains; to the west is the Conejos and Tierra Amarilla ranges. Southeast of the old city of Santa Fe and east of the Rio Grande, a broken range runs south, variously known as the Placer mountains, the Sandia, Manzana, Oscura, Jumanes, Fra Cristobal, Caballo, San Andres and Organs, the latter crossing the southern border of the Territory near El Paso. To the east of the above range is a series of high table-lands reaching to the mesa, known as the Llano Estacado or Staked Plains, and broken by the low mountains and peaks named on the maps as the Gallinas, Jacarillas, Carrizo, Capitan, Sierra Blanca, Guadalupe, Jarilla, Hueco and Sacramento.

On the west side of the Rio Grande, from the isolated peak near the northern boundary, known as the San Antonio mountain, another broken range runs south as follows, and known locally as Petaca, Valles, Jemes San Mateo, Ladrones, Oso, Magdalenas, Socorros, Gallinas, Southern San Mateo, Pinos Altos, Burro, Black and Mimbres ranges, and the Florida mountains near the southern border.

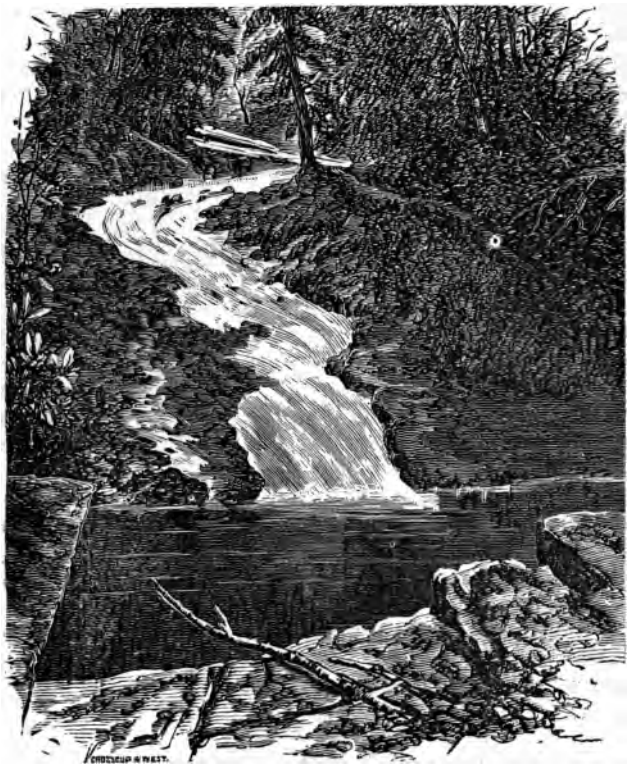
Farther to the west, and near the Arizona line, appears the continental divide, composed of mountains and peaks variously known as Tunicha, Chusca, Zuñi, Datil, San Francisco, Escudilla, Tulerosa, Luera, Mogollon, Pyramid, Stein's, Animas and Peloncillo.

These mountains, equabiy distributed as they are, furnish a large water supply, a great amount of timber, and are excellent shelter for stock during storms.

ALTITUDE.

The mesas and table-lands in the northern part of the Territory are generally about 6,000 to 6,500 feet above sea-level. In

the central portion of the Territory the mesas attain an elevation of about 5,000 feet, and in the south about 4,000 feet. The fall of the Rio Grande from the northern border of the Territory to the point where it cuts the New Mexico, Texas and Chihuahua boundary is about 3,500 feet. The ranges generally rise from 2,000 to 5,000 feet above the mesas and high table-lands. Mount Baldy, 18 miles from Santa Fe, is 12,202 feet high. Mount Taylor, in the Sierra San Mateo, is 11,200 feet high. Raton Pass, 7,893 feet; Costillo, 7,774 feet; Tierra Amarilla, 7,455 feet; Taos, 6,950 feet; Cimarron, 6,489 feet; Las Vegas, 6,452 feet; Glorieta, 7,587 feet; Santa Fe, 7,044 feet; Bernalillo, 5,104 feet; Albuquerque, 4,918 feet; Fort Wingate, 7,037 feet; Socorro, 4,655 feet; Silver City, 5,946; Fort Stanton, 5,800 feet; Las Cruces, 3,844 feet; El Paso, Texas, 3,662 feet; Tuc-



ON THE RIO SANTA FE.

son, Arizona, 2,542 feet. Some of the mining camps are at an elevation of from 7,200 to 8,500.

At Kansas City, 849 miles east of Santa Fe, the altitude is 763 feet; Denver, 338 miles north of Santa Fe, 5,240.

WATER-COURSES AND EXTENT.

The Rio Grande is the main river of the Territory. It rises in southwestern Colorado, at an elevation of 11,920 feet; it runs southerly and centrally through the Territory, mainly through a broad valley. Its tributaries are, from the west: The San Andres, the Chama, Jemez, Puerco of the East, Alamosa, Chuchillo Negro, Animas and Polomas; from the east: Costilla, San Cristobal, Hondo, Taos, Picuris, Santa Cruz, Namba, Santa Fe, Galisteo, Tuerto and Alamilla.

The eastern portion of the Territory is drained by the Canadian river (Rio Colorado) emptying into the Arkansas river; its tributaries are: Cimarron, Mora, Sapello, Concha, Pajarito, Ute, Revuelta and Trujillo.

The Pecos river rises in the Santa Fe range and drains the eastern and southeastern part of the Territory, emptying into the Rio Grande. Its principal tributaries are: Vaca, Tecolote, Bernal, Gallinas, Salado, Yeso, Spring, Hondo, Feliz, Atrasco, Pañasco, Seven Rivers and Black.

The northwestern part of the Territory is drained by the Rio San Juan, with tributaries as follows: Pinos, Navajo, Animas, La Plata and Mancos. The Puerco of the West, the Zuñi and Tulerosa rivers are in the central west.

The Rio Miembres, Rio Gila and San Francisco are in the extreme southwest of the Territory.

Numerous small streams, arroyas and springs are to be found all over the Territory.

MINERALS AND PRECIOUS STONES.

The mineral wealth of New Mexico has been known to exist for centuries. Indeed the traditions and knowledge existing among the village Indians of Mexico at the date of the conquest by Cortez was of a great people and of great mineral wealth in Aztlan, (the white or bright land,) as the country far to the north since named New Mexico was known early in the sixteenth century. It was less than a decade later than the landing of Cortez that the shipwrecked Cabeza de Baca and party started from the gulf coast, somewhere between the cities of New Orleans and Galveston upon the forlorn hope of reaching the settlements of their countrymen in Mexico. During the weary

that development commenced in real earnest. Sufficient has thus been demonstrated at the beginning of 1883 to clearly establish beyond doubt that New Mexico is one of the richest and most permanent in mineral resources of all the States and Territories; that there is within its borders several mines entitled to rank among the most remarkable and richest in yield in the known world. And that there is still not only a broad and most inviting field for the investment of capital, but that the chances for the prospector are equal, or better if possible, than any of the developed finds that have preceded. The writer does not hesitate to predict that New Mexico is upon the eve of one of most remarkable seasons of prosperity, as represented in its mineral resources that has ever fallen to the lot of a mineral bearing section; and presents the following facts as ear-marks of the truth of the statement asserted.

Generally the resources of the Territory consists very largely, of not only its mines of precious metals, but likewise of copper, lead, manganese and iron, besides mica, salt, coal, gypsum, soda, lime, kaoline, cement, sulphur, plumbago, mineral paints, marble and building stones. Precious stones, such as turquoise, garnet, moss agate and emerald are found. Valuable mining properties are found in every county.

Iron, lead and coal are practically inexhaustible. The coal* fields of Raton and of Colfax county generally, the San Juan river, near Tierra Amarilla; on the Cerrillos and on the Rio Galisteo, near Santa Fe; Bernalillo, on the line of the Atlantic and Pacific railroad; near San Antonio on the Atchison, Topeka and Santa Fe railroad and in Grant, San Miguel and Lincoln counties are immense.

The following mining camps are mentioned, all in various stages of development: Moreno, Placers, Elizabethtown, Poñil and Raton in Colfax county; Ciengilla, Rio Cristobal, Rio Colorado, Arroyo Hondo and Picuris in Taos county; Rio Arriba, Chama and Tierra Amarilla in Rio Arriba county; Mineral Hill in San Miguel county; Cerrillos, Bonanza, San Pedro, Golden, Lone Pine, Gonzales, Old and New Placers in Santa Fe county; Tijeras, Hell Cañon and Nacimiento in Bernalillo county. Camps in the Ladrones, Oscuro and Manzana ranges in Valencia county; Magdalena, Socorro, Gallinas, Pueblo, Water Cañon, Clairmont, Cooneys, Chloride, Grafton, Fairview, Robinson City and Cuchillo Negro in Socorro county; Hillsboro, Rincon, Lake Valley, Percha, Organs, Membrillo, San Andres, Upper and Lower Caballo and Tierra Blanca in Doña Ana county; Jicarillas, Sierra

*See appendix for extracts from reports on coal fields of New Mexico.

TOWN OF LAKE VALLEY.

Blanca, White Oaks and Nogal in Lincoln county; Silver City, Georgetown, Santa Rita, Pinos Altos, Shakspeare, Gillespie, White Water, Central City, Cook's Range, Eureka, Victoria, Steeple Rock, Burro Mountains, Florida and Stonewall in Grant County.

A few reduction works, smelters and stamp mills have been erected and are in operation in nearly every county of the Territory. Other establishments of like character are being erected.

One superior advantage is the equable climate of New Mexico, which admits of the working of all its mines the year round. Mining developments are growing with increasing activity. We repeat that the vast and varied mineral wealth of New Mexico, has been so far established before the mining world during the past five years, as to leave no shadow of doubt of its presence and permanency. Where there are so many valuable properties well worthy of special mention, it becomes exceedingly difficult in a brief paper to enter upon the task without danger of exciting a feeling of unjust discrimination. (An alphabetical list of mining camps in New Mexico, and how to reach them, is given in the first pages hereof.)

AN ILLUSTRATION.

There is, however, one young giant among the mining camps which has so wonderfully and so recently come into existence, and the fact with reference to which, read so much like a chapter from the Arabian Night's entertainment, that we here transfer an extract from a paper prepared by an able pen, and in which statement the writer hereof, who has personally visited and examined the camp in question, is prepared to verify.

There are at Daly (now Lake Valley), not less than 7,000 tons of ore on the dumps, running from $100 to $20,000 to the ton; and in the mines, already uncovered and exposed to view, there are certainly not less than 20,000 tons more of the same kind and richer ore. We believe we saw, in the two hours it took us to view the mines, not less than $15,000,000 worth of ore. That running from $200 to $300 to the ton is classed as low-grade in this camp. The pay begins at the grass roots and even in places at the croppings above the ground, and continues to a depth already reached of fifty feet, and along the hillside for a distance of probably 2,000 feet. The deepest shaft we descended was not over fifty feet, and the ore body was still pitching downward. Huge caverns have been excavated beneath the grass, with only a thin roof of limestone or porphyry from one to six or eight feet thick supported on timbers, which gives the place a wild, weird appearance, with its huge mountains of silver ore rolled one upon another by nature in her throes with some primeval volcano, and prepares one for the appearance, in some dark corner, of the genius who presides over nature's treasures. Instinctively one raises his candle to get a better view of the magic chambers. Here the rock is black and looks like iron slag from some huge forge; there it has a reddish cast, as though the internal fires to which it owes its origin had not yet cooled off; yonder the ore loses its characteristics as a rock formation and resembles a huge

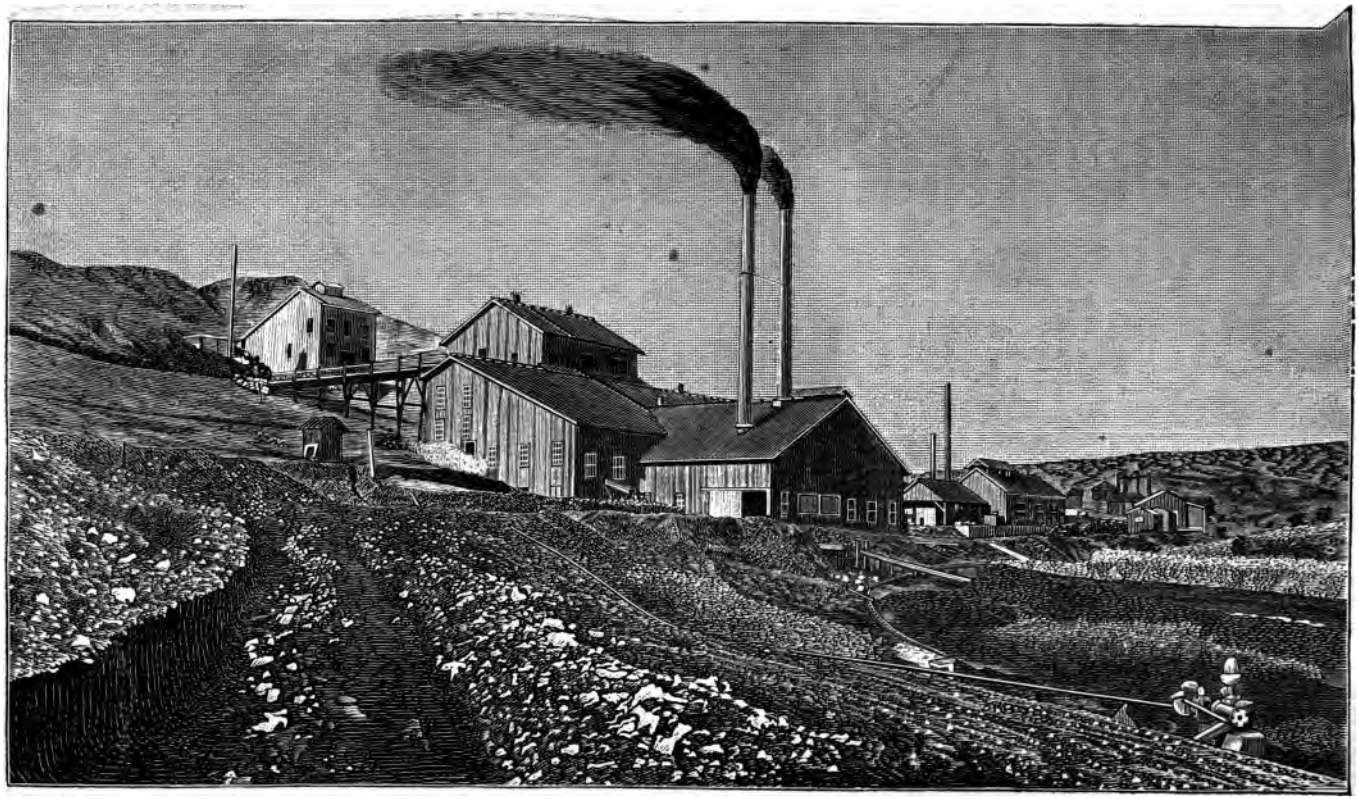
mass of soft quicksilver amalgam, both to the touch and to the eye; in another spot it hangs in beautiful, glistening, soft chloride crystals which feel damp in the hand, and when compressed yield to the pressure and assume the shape of the closed palm, like dough. The latter formation is more readily smelted than any ore we ever saw before, the flame of the candle sending the virgin silver dripping down the wall like shot. We had heard and doubted this story and were perfectly well aware of the fact that, according to the chemistry, it requires 1,873 degrees fahrenheit to fuse silver; yet we are now living witnesses to the fact that the flame of the candle held against the projecting crystals of chloride of silver in these mines, unaided by the blow-pipe, is sufficient to fuse them in half a minute. These chlorides run about $27,000 to the ton; and we certainly saw of them and horn silver (equally as rich) a hundred tons. The chamber containing these crystals is called the Bridal Chamber; and it is here that Governor Safford, of Arizona, offered to give $50,000 to be allowed to carry off and keep all the ore that he might by his own individual labor extract in ten hours. There is scarcely any waste rock. There are five piles of ore to one of waste; and it is with difficulty that rock is obtained for building the dumps to the height of a wagon without using ore for the purpose.—S. H. Newman, in El Paso Lone Star.

Two hundred thousand dollars have been expended in the erection of stamp mills and reduction works, $60,000 of the amount in the erection of pumping works, to elevate the water two hundred feet, and to conduct the same two miles through iron pipes to the camp. The works are a success and now in operation. The $7,000 chunk of the Lake Valley ore which was on exhibition at the exposition held at Denver last summer is well remembered.

FIRST SIX MONTH'S YIELD OF ONE MINE.

The following is an authentic copy of the Treasurer's statement to the company, of all monies received by him to date from the sale of Sierra Grande bullion, one of the leading properties at Lake Valley, as vouched for by the *Mining World* of January 1st, 1883:

1882.	
July 21	$ 17,110 34
" 29	22,199 19
Aug. 5	35,000.23
" 25	27,954.48
" 18	23,088.79
" 26	48,261.83
Sept. 5	51,814.68
" 8	20,322.69
" 9	22,263.99
" 14	40,241.13
" 16	2,131.02
" 27	44.758 45
" 28	5,835.00
Oct. 14	24,842 39
" 14	39,366.04
" 16	19,728.27
" 19	30,303.14
" 21	63,212.59
Nov. 16	55,477.45
" 24	131,157.81
Dec. 8	20,080.51
Total to date	$735,260.12



SMELTING AND SAMPLING WORKS, LAKE VALLEY.

A MORE RECENT ILLUSTRATION.

Northwesterly from Lake Valley about 25 miles, in the county of Grant, is another speciâlly rich mineral district known as the "Percha Country," situate upon the head waters of the river of same name, and which river is here divided into three branches. The district, as developed at this writing, extends north and south for a distance of about ten miles in the foot-hills along the eastern base or slope of the Southern Black Range. Its southern extremity is the group of mines upon the South Percha, from whence the district extends north crossing the middle stream and group of mines at Kingston to the north group of mines, centering about the "Solitaire" claim upon the north Percha.

The first discovery in the district was made in the summer of 1881 and has since proved to be a very rich property. The claim is known as the "Bullion," the first assay of which averaged $250 in silver to the ton. As reported by responsible experts at the beginning of the year, a shaft had been sunk 70 feet, out of which $30,000 had been taken. The new town of Kingston, located near this claim, has sprung into existence within the past few months. Its size and importance will be somewhat apparent from the fact that it already numbers among its business establishments a healthy looking and ably conducted folio newspaper of eight columns to the page. Quoting from the report last referred to—"the ore in the Bullion occurs in continuous pockets in the lime and near to a dyke of porphyry; the gaugue of the pocket is quartzose, calcareous and argallaceous, carrying iron and copper pyrites and silver antomonide. The outcrop shows rusty and black."

Other mines near the Bullion are the Superior, the Comstock, John S. Phelps, Polar Star, Miner's Dream, Silver Queen, Iron King and Illinois, and a large number of other claims of greater or less merit, many of which are commanding the attention of capitalists. The first named claim adjoins the Bullion and has been already largely developed with the most satisfactory results by a California company, having for its president Governor Perkins, and George Hearst as a managing stockholder and director. Machinery has just been purchased by the company and will soon be in place for the thorough working of the Superior. As the manuscript was being placed in the hands of the printer, a credible report comes that at the depth of 166 feet a well defined contact vein of five feet was struck in the Superior, out of which $5,000 was taken in less than twenty-four hours.

The Grey Eagle, for which there is a standing offer of $85,000 whenever a clear title can be given, and the Ontario, averaging 93 ounces, are representatives of a large number of claims partially developed and situate upon and near the South Percha.

The developments upon the North Percha have been very remarkable, some of the finds within the past few months giving promise of ranking with the best. The most prominent of the latter is the Solitaire, showing sixty per cent. silver in the outcroppings. One specimen of float of solid silver weighing over one hundred pounds was found. The ledge has been discovered and rich developments are expected. The Sinclare is an extension of the latter. The Brilliant is also of the same group. Jefferson Raynolds, the banker, is part owner and vouches for assays of the same made at Denver, running per ton respectively $1,700, $800, $400 and the lowest $153. A selected piece run $6,000. Of the district generally, experiences in development agree that: The mineral occurs in contacts between lime and porphyry, similiar to Leadville, with the exception in favor of Percha, that the contact is easily discovered; while in the Leadville region the prospector has often to sink blind through one hundred feet or more of wash or even a cap of porphyry.

POMOLOGY, AGRICULTURE, HORTICULTURE.

Agriculture is chiefly confined to the valleys, where irrigation can be made available. Some of the mountain parks produce the more hardy and short crops without irrigation.

There is more than sufficient agricultural land, which, if cultivated, would supply a home market equal in value to the highest industrial development of the Territory.

In horticulture sufficient has been demonstrated by amatuers to show the presence in various sections of the Territory of fruit trees in variety, of twenty years' growth and less, that are thrifty, clean and symmetrical in form, while their deep green foliage and prolific bearing give assurance of perfect health, and their superb flavor the highest adaptation of soil and temperature.

The range of fruits represented include those of Iowa, Illinois and Ohio, while the southern portion of the Territory also includes some of the semi-tropical fruits.

Experts in California fruits concede New Mexico to possess all the advantages of the latter in every essential of horticultural success. Especially is this a fact in the cultivation of the grape and in fruits indigenous to the northern States. New Mexico possesses all the advantages of the moderate temperature of the

VINEYARD AND FRUIT FARM, MESILLA VALLEY.

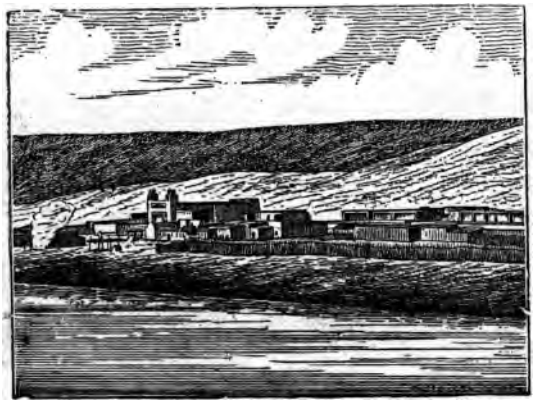
States named, with none of the disadvantages of the rigorous cold climate incident to the latter.

Under proper attention in cultivation, as reported at the Bureau of Immigration, Santa Fe, the yield per acre of wheat is from 15 to 50 bushels; corn, 40 to 60 bushels; oats, from 35 to 45 bushels, and that of vegetables is simply enormous. A twelve acre field of corn grown in the Placer mountains whithout irrigation the past season, samples of which are on exhibition at the bureau, compare favorably with eastern cultivation.

ARABLE AREA—IRRIGATION.

The amount of land susceptible of profitable cultivation is approximated, and something about irrigation and methods is given in the following extracts from a paper issued by the Bureau, and heretofore published in another form:

The United States census for 1880 will speak for itself. With a population of less than 120,000, New Mexico numbers 5,053 farms, covering a total area in round numbers of 450,000 acres, twenty-five per cent. of which land is under immediate cultivation. While it is true there is less arable land in the Territory relative to its entire area, as compared with the relative area of either of the central states, or States located upon the



SAN FELIPI PUEBLO ON THE RIO GRANDE.

slopes of the Mississippi valley, there is no doubt but the breadth of arable lands in New Mexico is nearly or quite equal to the average arable area of the eastern and middle States, excepting the States of New York and Pennsylvania, and quite as valuable to the farmer and fruit-grower. This statement of facts will not be doubted when the water system of the Territory is considered; and which includes the Rio Grande del Norte, heading in the mountains of western central Colorado, from whence it flows in a southeasterly direction to the central northern boundary of New Mexico, and enters the Territory carrying a large volume of water, and then meanders in a southerly course through a generally broad valley of arable land for five degrees of latitude to its central southern boundary. Another part of the water system is the Rio Pecos, which heads in the mountains east of Santa Fe, and in like manner flows in an easterly and southerly direction to the south, an a line equally dividing the eastern half of the Territory for two thirds its length. The Rio San Juan in the northwest, the Rio Canadian in the northeast, and the Rio Gila and Rio San Francisco in the southwest and the numerous tributaries of them all constitutes the water system. The valleys bordering on these several water courses, where irrigation is practicable, and the mountain parks where irrigation is unnecessary, it must be understood, are distributed over an area of Territory covering, as New Mexico does, an aggregate of square miles equal to the whole area of the six New England States, the great State of New York and the State of New Jersey thrown in. Excepting in several of the mountain parks, irrigation is more or less, a necessity. Nor must agriculture in consequence be regarded as less practical or profitable as a business. The

soil is uniformly good for cultivation, and under ditch water is brought equably and with certainty according to the necessities of vegetation, thus avoiding the effects of drouths. Another and important advantage in cultivation by irrigation, is the fertilizers in the form of mountain wash, brought in suspension and solution, and deposited, and whereby the natural exhaustion coming from cultivation is annually repaired, and the producing qualities of the soil kept good without additional trouble or expense.

A GOOD HOME MARKET.

Agriculture is now and will probably remain secondary to other and permanent interests, for illustration, mining. Secondary, I mean, in the sense that the value of agriculture and market gardening is dependent upon a home market, which is assured in the growing importance, permanence and diffused presence of mining industry. This home market, it must also be remembered, receives the natural protection from eastern competion by an overland transportation of hundreds of miles intervening. To the demands of the mining camps for the products of the farm and garden, may be added similar demands from innumerable cattle and sheep ranches.

The range of products to which the arable lands of New Mexico are adapted are varied, ranging from the more hardy varieties bordering on the great lakes of the north to the semi-tropical fruits and vegetables of the gulf. In vegetables and

fruits, especially, there are some instances where the perfection in flavor, yield and size is astonishing.

But a small proportion of the arable land of the Territory has thus far been brought under cultivation, the latter covering only a few hundred thousand acres and the system of irrigation crude and improvident.

Few, or none, of the economical methods known to modern systems have been introduced. Water conduits of iron, whereby soakage, evaporation and the general wastage incident to the present system are avoided, have not obtained. Saving of the water wastage and the surplus of the rainy season through systems of dams and store reservoirs, have no place as yet in New Mexico. Deep fall plowing, whereby the crust of the adobe soil would be loosened and the melting snows of winter be permitted to find their way into natural reservoirs is seldom to be seen. Enough, however, has been thus demonstrated to shadow a vast increase in agricultural productions. Deep fall plowing to absorb and hold the melting snows and moisture of winter, added to the opportunities afforded by a mild climate for early planting, renders it practicable in many places to bring broad areas under cultivation, which otherwise would be too uncertain to warrant the attempt.

With modern methods in irrigation applied to the water supply and equable distribution of the water, there is no reasonable doubt of the Territory or New Mexico, in its products of the soil, comparing favorably with the average State, as before stated, along the Atlantic slope.

In horticulture and viniculture, both tree and vine are of healthy growth, the fruit is of superior flavor and perfection, and compares favorably with the best. Grapes from New Mexico are already in demand and are shipped to eastern markets and sold at high prices. When horticulture shall have arrived at the same degree of development as that of the vine, it will likewise be in ready demand abroad as well as at home.

MARKET GARDENING.

Opportunities for market gardening are good in every portion of the Territory, and all kinds of produce commands unusually high prices. Prices at Santa Fe will average: Bunch of asparagus the size of a goblet, 20 cents; early radishes, 10 cents per dozen; new potatoes, two pounds for 25 cents; onions, 3 pounds for 25 cents; gooseberries, per quart, 25 cents; pie plant, 10 cents per pound; eggs, 40 cents per dozen; butter, fresh, 50 to 60 cents per pound; milk, 15 cents per quart; flour, $5 per hundred pounds; corn, $2.50; hay, $30 to $50 per ton, and all kinds of fruit in season in proportion.

CATTLE AND SHEEP.

The mesas and mountain parks supply food for stock. The grasses grow plentifully on the mesas, in the valleys and on the mountains, except in very dry seasons upon the mesas. The grasses, cured upon the ground in the fall in the dry atmosphere, retain their nutritious qualities and constitute the winter feed.

The mildness of the winter admits of stock feeding on the ranges the year round.

The practicability of sinking wells in many places now destitute of water is well known, and admits of bringing many square miles into use that are now outside of the immediate presence of water. Other square miles, now monopolized by those essaying to be the sole owners of water, may in like manner be taken possession of by stockmen, who will be to the expense of sinking for water. Windmills for raising water are also valuable and available. As every large mesa is more or less covered by deep arroyas or cañons, in the bottom of which water can be obtained a few feet from the surface, the whole area of the table lands can be made available for stock raising.

The Staked Plains, even, can be added to the grazing area by sinking wells and the use of windmills, as indicated.

PROFITS OF STOCK RAISING.

The following statement by Commissioner of Immigration, Whigham, of Colfax county, one of the best for stock raising, is valuable in this connection:

The principal industry of the county at present is raising cattle and sheep. The grazing lands of Colfax county are justly celebrated and are unrivalled in any section of the Rocky Mountains. No business has proved a more lucrative one here than stock raising. There are in Colfax at present, it is estimated, 75,000 head of cattle, 200,000 head of sheep and 7,000 head of horses and brood mares. The following table will not be out of place, as not only giving an estimate of the profits in the cattle business here—and it is indorsed by cattlemen hereabouts as a fair exhibit—but will also give current prices of common stock, with which it starts, and the price of the improved also.

Let us say the stock raiser makes a purchase in September of a herd composed of the following grade and class:

CAPITAL INVESTED IN STOCK.

150 young cows and calves, at $25	$2,250.00
100 two-year-old heifers, at $12	1,200.00
100 two-year-old steers, at $12	1,200.00
75 yearling heifers, at $7	525.00
75 yearling steers, at $7	525.00
10 high grade bulls, at $75	750.00
	$6,450 00

CAPITAL INVESTED IN RANCH, ETC.

Ranch, corrals, etc	$250.00
Horses and equipments	250.00
	$500.00

SUMMARY ACCOUN OR FIVE YEARS.

End of year.	No of stock.	Value.	Sales-3-y'r-old steers.	Expenses	Bank ccount.
First	530	$7,140.00	100 at $18.00. $1,800..	$680.00	$1,120.00
Second	655	8,465.00	75 at 18.00. 1,350..	750.00	600.00
Third	855	11,200.00	60 at 18.00. 1,080..	850.00	230.00
Fourth	1,063	14,620.00	100 at 22.50 2,250..	1,100.00	1,150.00
Fifth	1,321	18,477.50	130 at 22.50. 2,925..	1,500 00	1,425.00
Total	.....	.....	.....	.....	$4,525.00

Value of stock	$18,477.50
Value of ranches, horses, etc	1,000.00
Bank account	4,525.00
	24,002.50
Capital invested	6,950.00
Profit in five years	$17,052.50

In the above table we have added $500 to the value of the ranch, horses, etc., at the end of the five years, which is a low estimate of the money charged to "expenses" which went for the purchase of additional horses. The increase of cattle has been reckoned at 85 per cent. allowing 5 per cent. of loss from natural causes in young stock. The improvement in stock bred from fine bulls has been reckoned at 25 per cent.

While the cattle business is generally regarded as attended with less risk and more certain in its results, many claim for sheep raising a larger profit. Our observation—from fourteen years' residence in New Mexico and Colorado—is, that where it is desired to invest a large capital without giving a close personal attention to the business, cattle would be preferable, but where a man desires to invest a small or moderate capital in either business and give it his whole time, more money and quicker returns would be made by purchasing sheep. The annual wool clip is a timely, certain and good income to those who wish to invest the larger part of their capital at once.

The present prices of sheep and wool are as follows:

Common Mexican ewes, young	$ 1.50
Common Mexican wethers	1.25
Graded Merino ewes, young	2.00 to 3.00
Graded wethers	2.00 to 3.00

It is difficult to give quotations of wool, as they are constantly varying; prices this year, however, have been from 15 cents per pound for the lowest grade of Mexican, to 24 cents for the choicest improved, unwashed. The wool clip varies from 2 to 6 pounds on flocks of ewes and wethers. The general average in this county on all flocks would be 3 1-2 pounds. The net increase of sheep is 80 per cent.

The price of horses, broke to saddle or harness, varies from $40 for the ordinary stock pony to $50 for a good carriage horse.

Commissioner of Immigration Lea, for Lincoln county, writes: "The profits on stock raising are 50 per cent." These statements are substantially true in every part of the Territory.

VEGETABLE YIELD.

Commissioner Whigham, of Colfax county, states as follows:

In the production of many vegetables this county excels, especially in onions, beets and cabbage. Onions were grown here which were 7 inches in diameter and weighed 4 pounds each, and the delicacy of their flavor gives them peculiar excellence. Irish potatoes grow remarkably well throughout the mountains, 400 bushels to the acre having been frequently raised, and 200 bushels is an average crop; these potatoes are very fine, and the amount of potato land is practically unlimited. Cabbages have been grown at Cimarron which weighed from 30 to 37 pounds. A pumpkin grown on the Vermejo weighed 80 pounds.

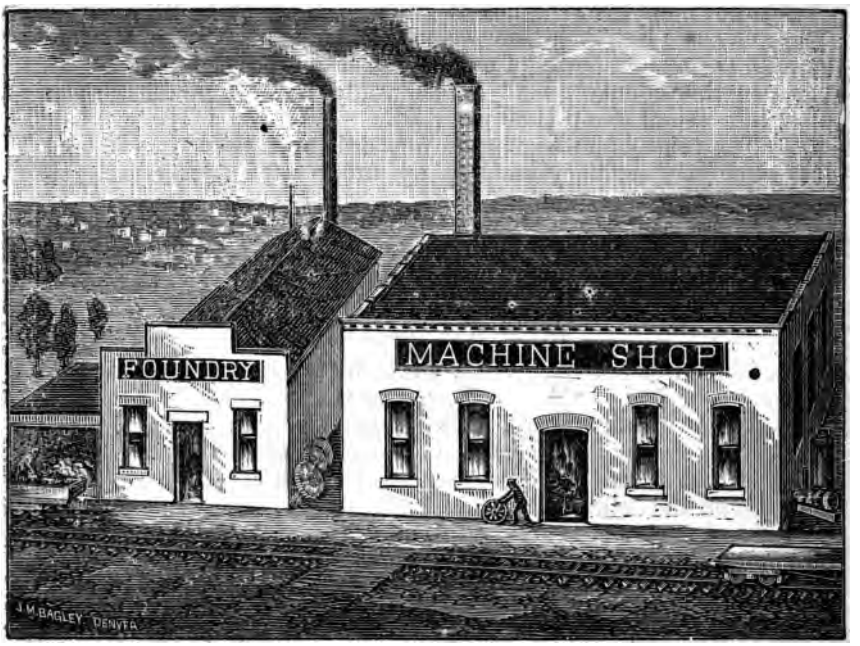
The above may be taken as applicable to the whole Territory, except as to potatoes, which are generally confined to mountain parks.

FRUITS AND SHADE TREES.

From the report of Commissioner Hazledine, Bernalillo county, we copy:

Until within a few years but slight attention has been paid in this part of the valley to the culture of fine fruit trees. Small July and October apples, red. (wild) plums, fair pears, good peaches, excellent apricots and enormous quinces have been raised successfully by the descendents of the Spaniards from time immemorial; also by the Indians of several of the pueblos.

Experience has proven that the finest apples and pears can be raised in this locality by grafting into the native stock. Set out the stock where it is to remain, and the second year cut off near the ground and graft into it with scions from fruit-bearing trees of the varieties desired.



SCENE IN ALBUQUERQUE.

In this way fruit-bearing trees can be secured much sooner than by planting the standard or dwarf tree from the eastern nurseries. Trees grafted as stated need tying to stakes for the first two years, to protect them from the high winds prevailing in the spring months; and all fruit trees on account of these winds should be pruned down and the branches kept as near the ground as possible. I have known trees grafted near the ground in April to grow seven feet in height by the fall of the leaf the same year, and stem just above the graft bulb to increase from the ordinary size of an apple scion to 1½ inches in diameter. All fruit trees are healthy in this valley if properly cared for, and yield enormously. The apricot and peach blossoming so early in the season, are uncertain crops, but the other tree fruits of the temperate zone are almost sure. In the lower valley the

fig and almond do well, and as far north as Valencia I have known fair crops to be raised.

NURSERIES.

Nurseries are needed in this portion of the valley, and no legitimate business would yield better financial results. In them should be raised for sale, not only fruit trees of all kinds and shrubs, but also a good assortment of evergreen and deciduous trees for shade purposes. Though but few countries need shade trees more than New Mexico, scarcely any have less. Its chief reliance is the cottonwood, which, though a rapid grower, is not desirable near a residence at the season of the year when the inevitable caterpillar breeds in its branches. The ailanthus does well and I should suppose the catalpa and silver leaved maple would also.

THE FRUIT-TREE BELT.

In this belt may be included, not only the valleys of the Rio Grande and Pecos, but also the higher lands on either side, and an extensive range to the north of this county. I remember that when the peach crop failed in the Rio Grande valley (in 1869, I think), the only peaches we got that year were from the Indian pueblo of Jemes, which has an altitude several hundred feet greater than Albuquerque and is about 40 miles farther north. Most excellent apples are raised at Santa Fe, and could be, I have no doubt, in many of the valleys in the mountains to the east, west, and north of us.

WOOL AND CATTLE PRODUCTS.

In a careful estimate based upon railway shipments, and from inquiries made at the centers of the wool trade in 1879, by Maj. T. B. Brooks, the yield of wool amounted to 10,500,000 pounds, produced by 5,000,000 sheep, being an average of a trifle over two pounds to the head. The value of the wool in local markets is from 10 to 20 cents per pound. The yield from native sheep is placed at 1 pound per head, and from thence through half-breed blooded stock and up to fine Californian Merinos, 6 pounds per head. The annual increase in sheep will average 80 per cent., worth on the ground from $1.50 to $1.75.

The number of cattle in the Territory is estimated at 500,000 head, yielding for market about 90,000 head annually, worth on the ground from $12 to $20 per head.

The marginal value on stock during the past year, by reasons of abundant rains and good pasturage, may with safety be placed at 20 per cent. advance on above figures.

The improvement of the breeds of cattle and sheep will greatly enhance the profits, and this fact has become so apparent that it is believed in a short time the cattle and sheep will equal those of the best grazing regions of the United States.

HORSES.

Horses in New Mexico are strong and healthy. Though small in size, they are better adapted to the uneven surface of the country than large ones. The grasses are nutritious, and horses thrive on them as well or better than they do upon the blue grass of Kentucky. They are numerous throughout all portions of the Territory, but there is no sufficient data from which to estimate their number; the proportion of horses to the number of people is much larger than in other countries. They can be cheaply raised, as they can subsist the entire year by grazing.

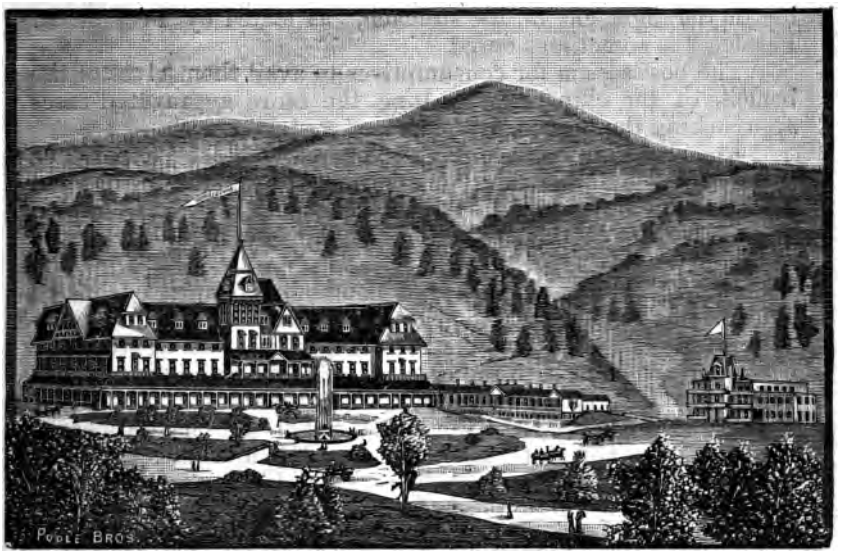
THE PUBLIC LANDS.

The laws of the United States, relating to the disposition of public lands, are well adapted in a country like New Mexico to place in the hands of a few men a monopoly in stock raising. The Territory suffers most from a want of permanent water. There are in many places small streams and springs, which supply water to large herds of stock. These are located under the homestead laws, or otherwise obtained, with a view to controlling the lands for miles around. Persons thus possessed of the water have the benefit of pasturage of large tracts, which belong to the government, without cost. If the policy were so changed that the public domain could be surveyed into tracts relative to the water supply for the same, and into tracts suitable to a yeomanry or to a homestead system, stock-growing monopolies would be prevented, and the country generally could be settled and occupied by stockmen having families on the ground, and what is more, having an abiding, personal and immediate interest in good order, low taxes and the permanent prosperity, and growth of the Territory.

The existing laws thwart their own purpose (which is to distribute lands among the people to the fullest extent possible) in all this dry and mountainous region. Their practical operation is to reinstate the Spanish and Mexican land grant system—those manorial estates which have excluded the poor from the possession of landed property, and cursed so many countries.

TIMBER.

Timber abounds in ample quantities and is well distributed for local purposes. With care in the prevention of forest fires the supply for home consumption and something for export would hold out indefinitely. It consists of pine, cedar and piñon; the latter especially valuable for fire wood. Ash, oak, maple and black walnut are also found in sections.



MONTEZUMA HOTEL AND BATH HOUSES, LAS VEGAS SPRINGS.

A SANITARIUM.

That the Territory has superior sanitary advantages, as represented in high altitudes, equable temperatures, dry atmosphere, generous sunshine and mineral and hot springs, is manifest.

Pulmonary complaints generally experience prompt relief, if the disease is not too far advanced when the patient seeks the benefits. Frequent instances of aggravated cases in consumption, however, have received relief and life prolonged to ripe old age, simply by approaching the high altitude by slow stages,—taking from thirty to ninety days en route from the Missouri river. The experience of Dr. Josiah Gregg, an old Santa Fe trader, and author of the "Commerce of the Prairies," is a conspicuous illustration of this class of cases. The story is told in his book. Dr. Gregg, in brief, crossed the plains with a

caravan of merchandise and was three months en route. He started on the trip in desperation—as a last chance. Upon arriving in Santa Fe his relief was so satisfactory that he at once engaged regularly in the trade and continued the business many years, enjoying comparatively excellent health.

The advantages of open air life on the plains, particularly as experienced in travel and camp life, is efficacious.

Asthma, as a rule is not benefited, although when "depending on derangement of the stomach," as stated by Prof. E. R. Peaslee, "is sometimes cured."

The best season for consumptives to avail themselves of the benefits of the climate is in June, the more aggravated cases approaching the higher altitude by easy stages.

Rheumatism, cutaneous and venereal diseases experience speedy relief by a few days' or weeks' bathing in the springs and drinking the waters. Sun stroke, it is said, never was known in the Territory; this by reason of the low humidity in the atmosphere.

Heart diseases and nervous complaints would be out of place in this rarified and electric atmosphere. In the mountainous and more humid sections rheumatism is more aggravated; while persons coming to the country afflicted with it experience great benefits in the dry and more sunny sections.

Along the lower Rio Grande malarial diseases have appeared periodically. The first known was in 1821, and since, respectively, in 1857, 1877, and again in a milder form during the past year. This will no doubt be overcome by proper drainage.

COMPARATIVE DEATH RATE.

The comparative death rate, as given in the census reports of 1860 and 1870, makes New England 25, to Minnesota 14, the Southern States 6, and New Mexico 3.

Dr. Lewis Kennon, a physician of experience, and for many years employed in the army, says: "The lowest death rate from tubercular diseases is in New Mexico.

Medical statistics of the United States army in the six years from 1849 to 1854 referring to the respiratory system, says: "New York, New England and the regions about the great lakes, exhibit the largest ratios, and Florida, Texas and New Mexico the smallest, being in the ratio of cases per 1,000 of mean strength: New England, 4.8; New York harbor, 5.9; great lakes, 4.5; Atlantic coast of Florida, 2.3; gulf coast of Florida, 6.9; Texas southern frontier, 4.0; western frontier of Texas, 3.9; New Mexico, 1.3." Hammond's hygiene testifies to the fact that "New Mexico is by far the most favorable residence in the

United States for those predisposed to or affected with phthisis." We are indebted to the Smithsonian report of 1876 for the above quotations.

THE EXTREME PURITY OF THE ATMOSPHERE.

The amount of ozone (electricity) in the Rocky Mountain regions, especially in this altitude, is relatively much greater than in the central and sea-board states.

Indeed ozone will not tolerate impurities and cannot remain in its presence. Hence, the extreme purity of the atmosphere. In illustration, raw meats are cut up and dried, preserved and stored for future use. In spite of the absence of any system of sewerage at such centers of population, among others, as Taos, Santa Fe, Socorro and Silver City, beyond natural drainage and the cleansing coming from occasional copious showers, there is an extreme healthfulness among the people. This fact has made the saying proverbial of the native population that: "It is a country where none die except with their boots on," and of the octogenarian that he "dries up and is blown away."

HUMIDITY, RAIN, TEMPERATURE.

By reference to the reports of the chief signal office of the army it will be seen, that at the signal service station at Santa Fe and upon the high line of the continent, humidity ranges a large percentage less than in either the Central, Atlantic or Gulf States. The average is 80 per cent. upon the New England coast and 33 per cent. at the Rocky Mountain stations.

The year ending June 30, 1875, is cited as an average year as to rainfall.

	Rainfall in inches.
Santa Fe	16.68
Denver, Col	15.24
Salt Lake City	20.24
San Francisco	21.54
Colorado Springs	15.24
Galveston	46.44
New Orleans	74.98

The temperature for the year ending June 30, 1875, in the extremes stood as follows:

FAHRENHEIT.

	Maximum.	Minimum.
Santa Fe	Aug. 2nd, 89°	Feb. 24th, 2°
Denver, Col	July 4th, 102°	Jan. 9th, 29° below zero.
Colorado Springs	July 11th, 98°	Jan. 13th, 25° " "
Salt Lake	July 1st, 98°	Jan. 16th, 5° " "
San Francisco	Sept. 14th, 89°	Dec. 26th, 40°

The monthly maximum velocity (miles per hour) of the wind at Santa Fe in 1876, stands 24 each for June and December, to 32 in March, and rising to 38 in October. (Forty-five miles to the hour is set down as a gale.) The following is the meteorological summary at Santa Fe, N. M., for seven years:

[*Compiled from U. S. Signal Service Records.*]

Year.	Mean Barometer.	Thermometer.			Wind.		Rainfall.	No. of Days rain or snow fell.
		Mean	Max	Min	Prevailing Direction.	Highest velocity (Miles per hour)		
1874	29.756	48.9	89	0	E. & S. W.	42	19.83	97
1875	29.753	48.6	90	2	S. W.	50	7.58	76
1876	29.796	48.1	89	-1	S. W.	38	15.07	109
1877	29.809	48.3	90.5	2	S.W.&N.W	43	11.10	109
1878	29.799	47.6	97	-2	N.	38	19.55	103
1879	29.843	50.6	95	-13	E.	32	11.44	87
1880	29.81	46.6	88	-11	N.W.	32	9.89	88

The amount of rainfall at Santa Fe in 1881 was 21 inches, and vegetation was greatly benefited.

FIRST NATIONAL BANK, LAS VEGAS.

MINERAL AND MEDICINAL SPRINGS OF NEW MEXICO.

The mineral and medicinal springs of New Mexico are numerous and are found in nearly every section of the Territory. They are deservedly popular and universally known in the southwest, and by everybody familiar with the locality, as possessing, in a pre-eminent degree, for many complaints, the medicinal properties sought at the great health resorts of the world.

For centuries, not only the people of New Mexico but northern Mexico, and laterly from central and southern Mexico,

and from all points near New Mexico, have traveled in private conveyances long and weary journeys, beset by hostile Indians, in order to avail themselves of the curative properties of these springs. Conspicuous among those visiting these springs in early days were the Franciscan and Dominican friars.

Now that the railroad has entered New Mexico from every point of compass, with lines running conveniently near to several of these springs, they are placed within easy and comfortable reach of the world. Good hotels and bath-houses and superior accommodations have recently been provided for the rapidly growing demands of invalids and tourists.

Analysis of several of the springs have been made by competent persons, and are herein presented for the consideration of those interested.

THE DISEASES IN WHICH THESE WATERS ARE EFFICACIOUS AND BENEFICIAL.

The following is copied from a statement prepared by the physicians of one of the springs most resorted to, and may be accepted as equally applicable to either of the other springs open to visitors:

"The following ills are almost invariably cured, while many sufferers with other diseases not curable, have received great benefit from bathing in and drinking these waters: Chronic and acute rheumatism, gout, scrofula, stiff joints, skin diseases as a class, ulcerations and enlargements of the glands, general physical debility, mental exhaustion, spinal disease, sciatica, lumbago, paralysis, St. Vitus dance, and all nueralgic or nervous affections, catarrh or ozena in all forms, dyspepsia, liver diseases, early stages of Bright's disease, diabetes, goitre, specific locomotion, ataxia, spurious vaccination, and all blood poisons and female diseases. Pulmonary diseases, not too far advanced, are very successfully treated, both the purity of the atmosphere and the mild, equable temperature no doubt contributing largely to the general good result in such cases."

Referring to the same subject in Wheeler's United States Geological Survey, Prof. Leow says:

"Science as well as experience has demonstrated beyond a doubt that for consumptives the climate of New Mexico far surpasses that of Minnesota, California or Florida."

HOTELS AND BATH HOUSES, AND HOW TO REACH THEM.

Las Vegas Hot Springs has two new hotels and bath houses, and is fitted both by nature and art for a pleasure as well as health resort. It is immediately connected with the Atchison,

Topeka and Santa Fe railroad by a branch railway running to Las Vegas station, six miles away.

Ojo Caliente (Taos county), Joseph's, near the ruins of an ancient Indian pueblo, has hotel and bath house, and is connected by daily stage with Barranca Station on the Denver and Rio Grande railroad, twelve miles away.

Jemez Hot Springs, in the cañon, twelve miles above the Indian pueblo of the same name, has a new hotel and bath house and is connected by stage with Bernalillo Station on the A., T. & S. F. R. R.; distance forty miles.

Hudson's Hot Springs has a well established hotel with bath houses, and is connected by railroad with Deming Junction on the A., T. & S. F., and Southern Pacific; distance 25 miles.

(*Analysis of Joseph's Ojo Caliente.*)

Of this group of springs there are four in number, of nearly the same analysis, of which the analysis is here given of No. 1. It has a basin twenty feet long, nine feet wide and a temperature of 114.5° Fahrenheit. In one hundred thousand parts of water, as analyzed by Prof. O. C. Marsh, of Yale College, copied from a business circular, are contained parts, as follows:

CONSTITUENTS.

Sodium carbonate	196.95
Calcium carbonate	4.20
Iron carbonate	20.12
Sodium chloride	40.08
Lithium carbonate	1.22
Magnesium carbonate	6.10
Potassium sulphate	5.20
Silicic	4.10
Arsenic	10.08
Total	288.09

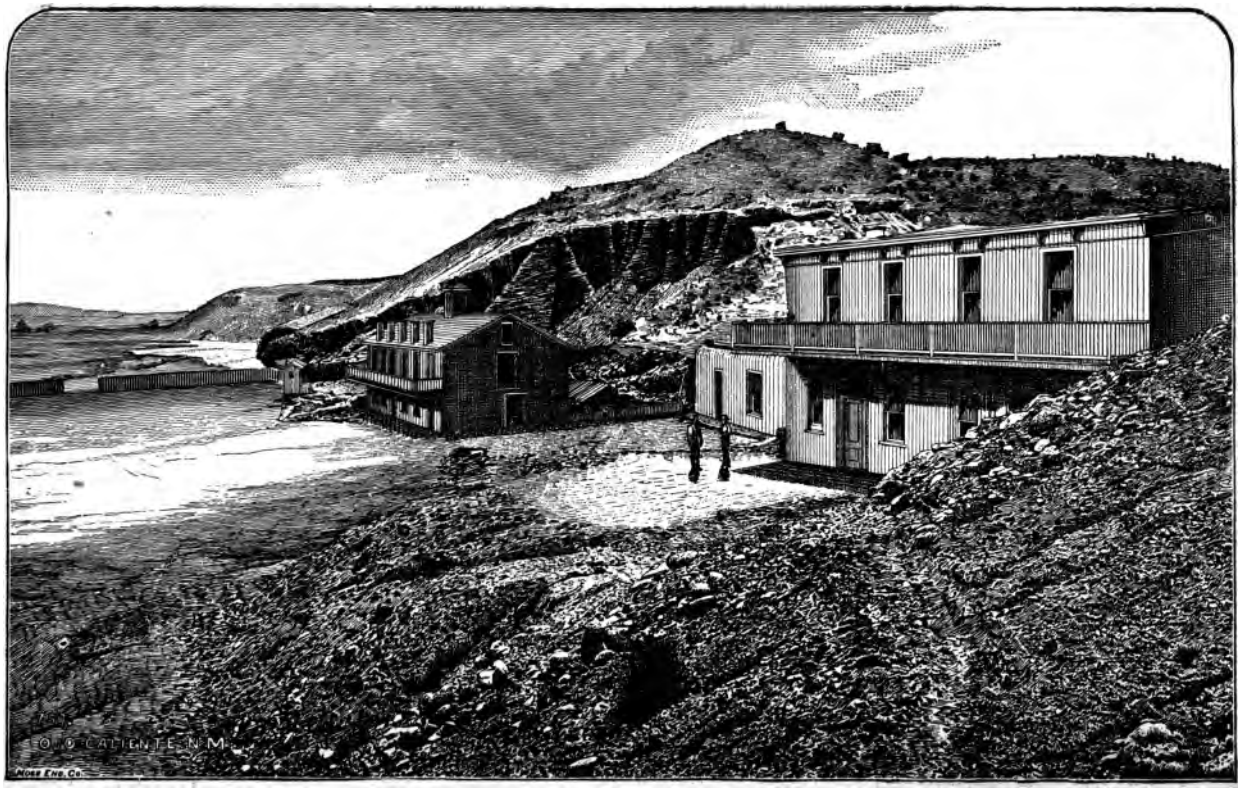
Gases, carbonic acid.

Prof. Leow says of the waters: "They are of good quality." The flow is copious.

There are a number of soda springs three miles above Ojo Caliente on the same stream, located upon the bluff, and whose collective flow descends in considerable volume and forms an interesting veil or sheet of water as it breaks over the brow of the bluff. A cave beneath the latter has been found, having on all sides, deposits from the water. Its depth is about forty feet and six by eight feet in size. The bluffs are likewise of the same formation.

JEMEZ HOT SPRINGS.

There are two distinct groups of warm springs in the valley, two miles apart. The springs of the lower group consist of six in number. The chief of which is:



JOSEPH'S OJO CALIENTE, TAOS COUNTY.

A geyser with a surface of sixty square feet, and an aperture of one square foot; the temperature is 168° F.; large quantities of escaping carbonic acid keep the water in violent agitation; thick deposits of snow-white crusts are formed, consisting chiefly of carbonate of lime. This spring yields about fifty gallons of water per minute.

(*Analysis by Prof. Leow.*)

The water of the geyser contained in 100 parts:

Chloride of sodium	0.1622
Sulphate of soda	0.0035
Carbonate of lime	0.0641
Carbonate of magnesia	0.0103
Potassa, Lithia, Silicic acid, Sulphate of lime	Traces.
Total amount of salts	0.2401

Tests were made for iodine in the evaporation of residue of several gallons of the water, but none was detected.

SAN YSIDRO SPRINGS (NEAR JEMEZ.)

Its waters are rich in carbonic acid and of very agreeable taste.

(*Analysis by Prof. Leow.*)

It contains in 100 parts:

Chloride of sodium	0.3072
Sulphate of soda	0.1639
Corbonate of lime	0.0670
Carbonate of magnesia	0.0246
Carbonate of iron	0.0008
Potassa, Lithia, Silicic	Tracers.
Total	0.563

LAS VEGAS HOT SPRINGS.

The temperature of these springs range from 90° F. to 130° F, and there is a large number of them. No. 1 has a basin six feet deep, five feet long, four feet wide; taste, weak saline; no odor observable; bubbles of carbonic acid constantly rising; yield, about fifteen gallons per minute.

(*Analysis by Prof. F. V. Hayden.*)

It is copied from the business circular of the Springs.

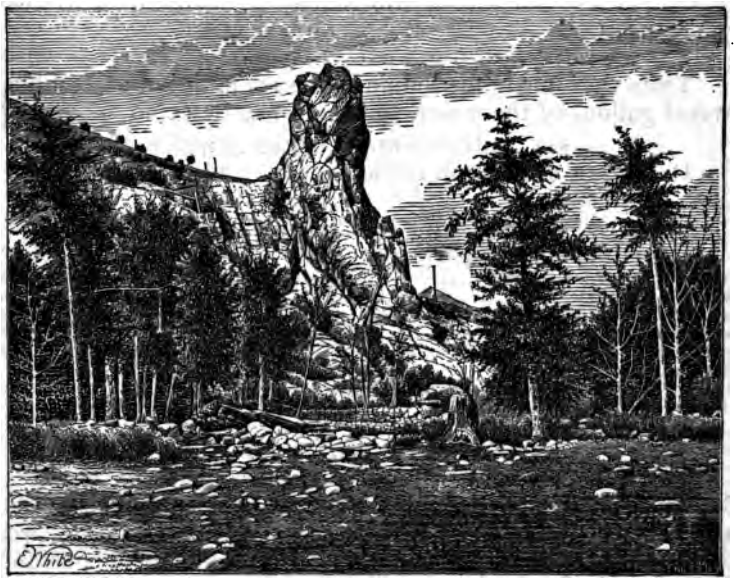
Constituents.	Spring No. 1.	No. 2.	No. 3.
Sodium carbonate	1.72	1.17	5.00
Calcium " / Magnesium "	1.08	10.63	11.43
Sodium sulphate	14.12	15.43	16.21
Sodium chloride	27.26	24.37	27.34
Potassium	Trace	Trace	Trace
Lithium	Strong Trace	Strong Trace	Strong Trace
Silicic acid	1.04	Trace	2.51
Iodine	Trace	Trace	Trace
Bromine	Trace	Trace	Trace
Temperature	130 F.	123 F.	123 F.

There is another, but a cool mineral spring, three miles northeast of Las Vegas and two miles east of Green's ranch. It showed the following composition:

(*Analysis by Prof. Leow.*)

In one hundred thousand parts of water are parts as follows:

Sodium carbonate	120.00
Calcium carbonate / Magnesium carbonate	13.73
Sodium sulphate	5.26
Sodium chloride	6.41
Silicic acid	Trace.
Total	145.42

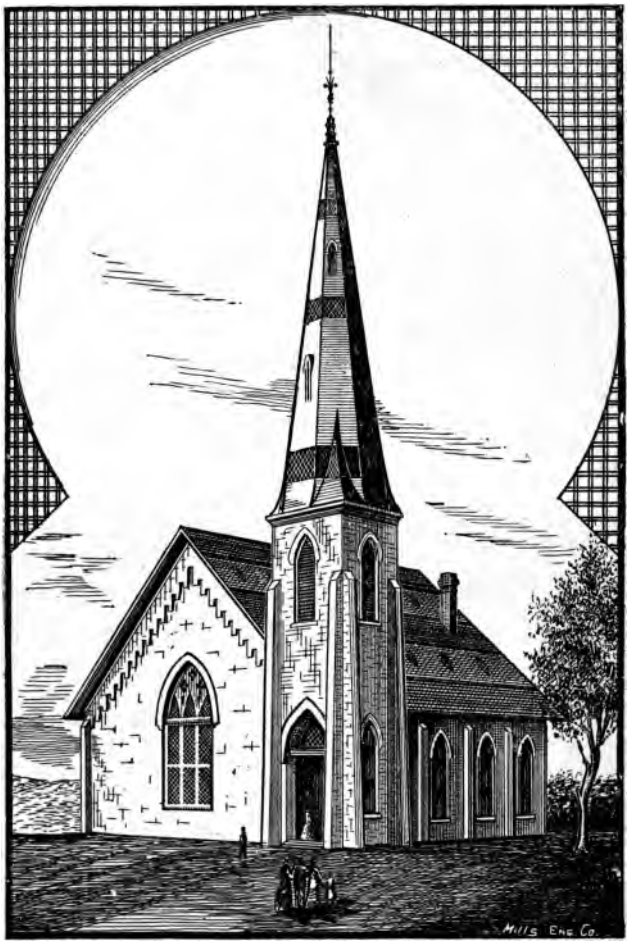


MONUMENT ROCK, RIO SANTA FE.

SANTA FE SPRINGS.

Four miles east of the city of Santa Fe, in the cañon of the same name, are two mineral springs well known to the Mexicans, and which, in generations past, were much resorted to by Franciscan friars and others in cases of general debility and in nervous complaints. With the general changes incident to revolutions and conquest during the past two generations, these springs have been almost wholly lost to memory.

The attention of a physician at Santa Fe was recently called to them, and upon some inquiry and a casual examination, he



PRESBYTERIAN CHURCH, 1867—83, SANTA FE.

Originally erected by Baptists, 1853; new structure erected in 1881. First Presbyterian Church in New Mexico.

was prompted to make a careful analysis, such as was possible with the means at hand. Taking one gallon of water, the result was as follows: 21½ grains of solid matter dried by a temperature of 212 F.

CONTENTS OF THE SOLID MATTER.

Proto Oxide of Iron.		Medium.
Lithium.		do
Magnesium.	Carbonate.	Prominent.
Potassium.	do	do
Sodium.	do	do
Chlorine.	Acid.	Proportionate.
Carbonic.	do	do
Sulphuric.	do	do

The flow from each of these springs is copious. They are situate at an altitude of about 7,500 feet, with surroundings of pine and cedar trees.

Analysis of the southern springs have none of them come to hand although every effort has been made to obtain them.

The following, upon religion and private schools, was prepared by the writer for and published in the Blue Book of New Mexico for 1882.

RELIGION.

The prevailing religion is largely Roman Catholic. The Territory, with the State of Colorado and the Territory of Arizona, constitute an Archepiscopal See or province of this faith, with Santa Fe as the metropolis, and His Grace, the Most Rev. John B. Lamy as primate. The Jesuits, as an organization, are represented in considerable force, having a provincial of the order and an ably conducted newspaper on the ground. The Christian Brothers, the Sisters of Loretto the Sisters of Charity are likewise represented in considerable force. In addition there is a large force of priests. Protestant denominations are represented by the Episcopals in a new missionary jurisdiction, including New Mexico and Arizona, with the Right Reverend George Kelly Dunlop as primate, residing at Santa Fe, and having six clergymen in the jurisdiction.

The Presbyterians and Methodists are represented in the principal towns by a dozen or more clergymen each and communicants to the number of 700 each, and probably five times as many more in sympathy with them if not all attendants at church. The Baptists, Congregationalists and Southern Methodists have each a couple of clergymen on the ground, and bid fair to become permanent. The Mormons have also gained a foothold on its domain.

LAS VEGAS ACADEMY.

EDUCATION.

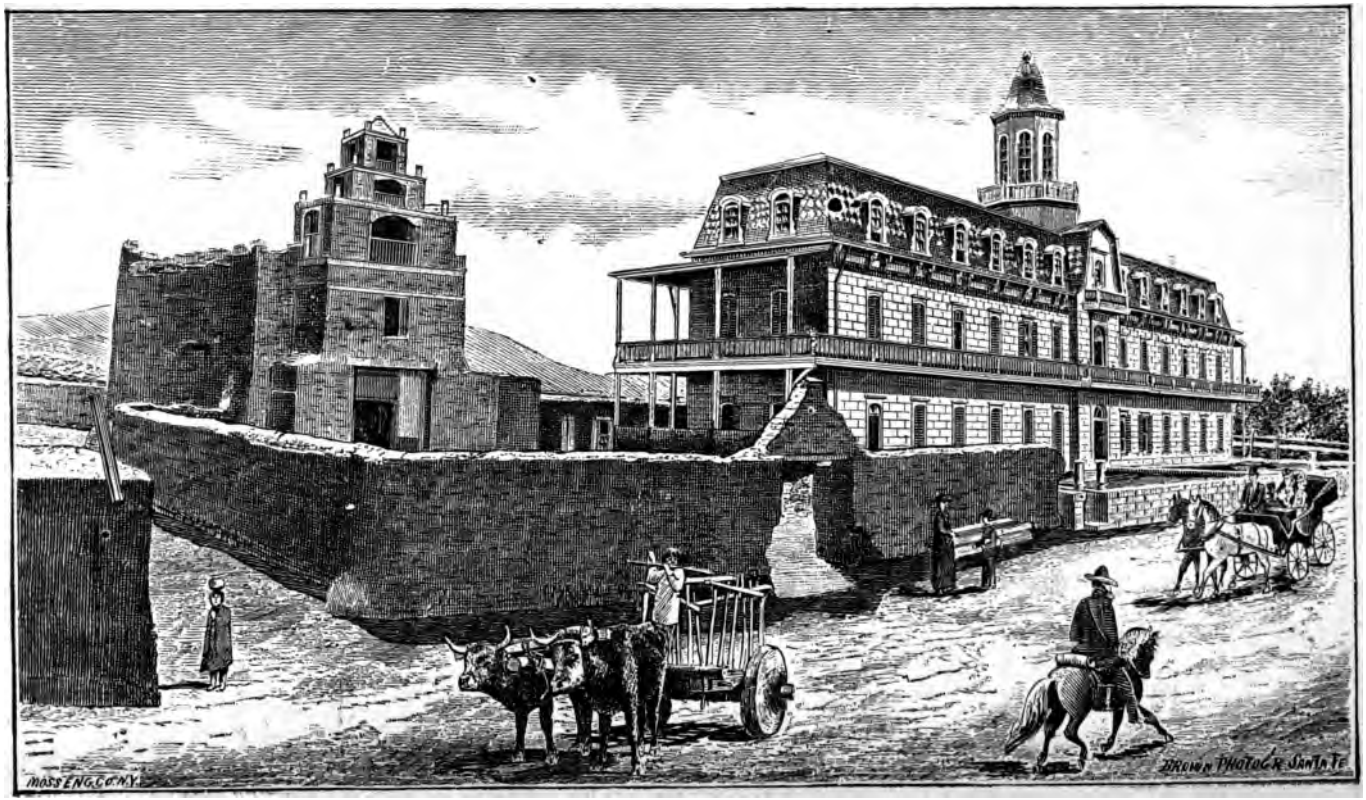
All the protestant denominations have Sabbath schools connected with their churches and probably command an aggregate attendance of 2,000 children. The Roman Catholics are represented in all the more important towns and neighborhoods by parochial and academic schools, variously under the charge and control of the Jesuits, Christian Brothers, Sisters of Loretto, or Sisters of Charity, and largely supported in most of the counties by the public school funds. This church and its orders have erected fine edifices, especially at Santa Fe, Las Vegas and Albuquerque. The Protestant denominations are also represented at the capital and in the larger towns by primary and academic schools which constitute an important feature in the present educational facilities in the Territory. Commodious school buildings have been erected for their accomodation at Santa Fe, Albuquerque and Las Vegas.

The latter schools are supported wholly either by private contributions or by tuition fees, much of the money coming from abroad.

Governor Sheldon, in his report to the Secretary of the Interior for 1881, remarks as follows with respect to public schools and land grants:

PUBLIC SCHOOLS.

In a country where population is sparse it is not unusual that schools are neglected. This Territory, until within the last twelve months, has been remote from the densely populated and highly developed sections of the United States, in consequence of the absence of the means of rapid transit by railroad. The



SAN MIGUEL CHURCH, 1613; COLLEGE, 1880, SANTA FE.

masses of the people have been poor, and only the few have been enabled to send their children away for instruction. Education, therefore, has been partial, and the absence of libraries and newspapers has left the masses of the people less intelligent than those in other parts of the nation, who have been favored with better advantages.

From time to time the legislature has passed acts relating to this subject, and from them can be drawn by a person disposed to liberally construe statutes in favor of schools a respectable school system. There are a good many defects, however, to be remedied, and yet there are some excellent features.

Education is compulsory for five months of the year, and the law contemplates that schools shall be open for all children, without regard to religious creed, nativity, or condition.

One-fourth of the taxes raised in the several counties is set apart for school purposes. The machinery of the school system is not very complete, but the chief trouble lies in neglect to execute the law. In some localities it is not executed at all, and in others but indifferently, although more or less money is collected for school purposes in every locality. There are some difficulties in the way of prosperous schools very hard to overcome; they are, scattered population, except in the towns, and the prevalence of two languages among the people. Only a few of the natives can understand or speak the English language, and the same is true as to the bulk of those who have immigrated since the aquisition of the country in regard to the Spanish language. It is desirable that in every nation there should be homogenity of language, and it may be wise to require the teaching of the prevailing language in all the schools. Yet, to adopt such a rule here, would prevent a majority of the children from being educated in the public schools. The disposition to encourage education is creditible, as judged by the laws on the subject, from the fact that there are a good many flourishing private schools in the Territory and from the general sentiment of the people, this feeling is rapidly growing, and the influx of intelligent and enterprising people will give it a greater impetus. Intelligence is becoming more general through the agency of newspapers, which are now established in all the principal towns, and many of them are entitled to great respect for ability and enterprise. As a Territory, New Mexico is in a condition of pupilage, preparatory to assuming the position of a state, it may be wise for Congress to deal with the subject of schools so far as to see that the true American idea, that the system shall give ample and equal advantages to all classes, be carried out, and that such system be maintained, whenever necessity seems to

demand it, by contributions from the national resources or the imposition of a sufficient tax upon the property of the Territory.

LAND GRANTS.

New Mexico seems to have been well covered with grants of land, real or pretended, while under the dominion of the Spanish and Mexican governments. The lands embraced in these, having been withdrawn from entry and sale, are effectually in mortmain until the questions as to their validity is finally settled. Title to these lands is uncertain, and their settlement and development are prevented to a great extent. Quite a number of these claims are unconfirmed, and little or no effort has been made to procure their confirmation. Charges of fraud and crime are made as to some that are confirmed, such as forgery of papers, perjury, subornation of perjury, and false and erroneous surveys. This fact and the lapse of time challenge the utmost scrutiny into those which may be presented in the future. It would be the greatest blessing if an early day could be set when the land grant incubus should be entirely removed from this Territory. It seems to me that it would not violate the stipulations of the treaty of Guadalupe Hidalgo if a time were fixed within which applications for confirmations should be made, and if not made within such a period, that they be forever prescribed.

I respectfully suggest that the period be short and follow the precedent of the last act relating to the confirmation of grants in Louisiana and Missouri, which was three years.

MODERNIZING.

To mention a few human activities added or to which force has been given during the past three years; civic societies are represented in Masonry, Odd Fellowship, Good Templars and Knights of Pythias. An annual Territorial Exposition was organized in 1881, at Albuquerque, which has held two exhibitions with encouraging results and has a third appointed with success assured. One hundred postoffices have been established, chiefly within the past two years. Educational facilities have been largely increased. The Historical Society has been revived at Santa Fe. Gaslight, water works, the telephone and horse railroads are among the modern improvements found at Santa Fe, Las Vegas, Albuquerque and elsewhere. Thirty stamp mills and reduction works have been erected or are in course of erection in various mining centers. Grand hotel edifices with first-class appointments and substantial business blocks and fire proof warehouses are to be seen in all the principal

towns. Manufactories of various kinds are springing up and a general look of permanence is apparent.

SCENES IN ALBUQUERQUE.

Newspapers during the past three years have more than doubled in numbers, quadrupled in quality, and in circulation undoubtedly command a dozen times the number of readers that they did prior to that date. Where there were no dailies then there are now eight, some of which in quality are equal to the best upon the high line of the continent. There are likewise 2 semi-weeklies, 27 weeklies, 1 semi monthly and one monthly. All this and 12,000 of skilled industrial operatives have followed in the wake of the building and operating of a thousand miles of railroad.

ADIOS.

Thus is presented the whole question of the importance of New Mexico in its resources and advantages. Wealth seeks investment where there is profit, and is unerring in its judgment as no other representative of human intelligence can be. Among the visitors and immigrants attracted to the Territory during the past two years have been the most distinguished personages of the land in every walk of life. Commerce, the professions, skilled labor, capitalists and public officers have all been represented.

Immigration has set in, capital is concentrating upon the land and the grand opportunities represented in New Mexico's mines, vines, valleys, mountains, mesas, and its great health-giving properties, its majestic mountains and sublime scenery are being possessed and enjoyed by the industry, intelligence and wealth of the world. Just here it may be assuring to know that opportunities are very far from being all taken and interesting to be reminded, that the area of New Mexico, as before stated, exceeds that of solid New England by 57,523 square miles, and that the Territory equals in area New England and New York combined, with New Jersey thrown in.

SOUTHERN NEW MEXICO BOQUET.

MINES AND MINING.

BY COUNTIES.

As Reported upon by the Commissioners of Immigration for the respective counties, to the Bureau of Immigration.

Most of these reports were made a year ago, and consequently do not in such cases include recent discoveries and developments of which there are many.

BERNALILLO COUNTY.

(*Prof. Charles S. Howe, B. S.*)

Until within a very short time New Mexico has been comparatively unknown. The cause of this may be found in its isolation, by reason of not having railroad communication with other States. History informs us that soon after the conquest of Old Mexico, the Spaniards pushed up into this region, conquered it and worked on an extensive scale its mines and placers. Ruins of old cities and towns, with their churches, turreted and loop-holed for defense, are found scattered all over the country. Many of them are in mountainous regions where the only industry possible was mining. They could not have been built for defense, because the cities are large and some of them must have contained thousands of people. Numerous ruins of smelters are also found, giving indisputable evidence that mines were

once worked on a large scale. Two hundred years ago the Indians, who had been enslaved and forced to work these mines, broke out in rebellion and drove the Spaniards from the country. So intense was their hatred toward those places in which they had been forced to labor, that they filled up every old mine so that no trace could be found of them. A number of years after the Spaniards were allowed to return to the country, but only on condition that the mines should never be opened or worked. This condition seems to have been faithfully kept, and for many years mining was wholly abandoned in the Territory. During the early part of this century we hear of some of these old mines being opened and new ones being discovered, but they were never worked to any great extent. The Indians were hostile, transportation was expensive, and the methods of working ore very crude. It is only within a short period that the mines of New Mexico have begun to attract attention.

Bernalillo county contains some of the most valuable of these old Spanish mines. Several districts have already been opened and work enough done to prove their richness. The greatest variety of minerals abound within the limits of the county. Gold, silver, copper, lead, iron, coal and lime are found in large quantites. Granite and sandstone for building purposes are found in numerous places. Immense masses of crystallized gypsum are found in the southern part of the county. The value of this mineral as a fertilizer and for use in the arts is too well known to need explanation.

COAL.

On the Rio Puerco, about twenty miles from Albuquerque, several veins have been opened which vary from four to eight feet in width. In Tijeras cañon one vein is nine feet thick and very pure. Other veins are known to exist in these and other localities, but they have never been opened. There has been no demand for coal here until within a short time and consequently none has been taken out.

MINING DISTRICTS.

HELL CANON

is situated twenty miles east from Albuquerque, on the west side of the Sandia mountains. This mining district was discovered in the summer of 1879. The ore is a decomposed quartz carrying free gold, some silver and copper. The Manzanita is a lode of gold-bearing quartz from fifteen to twenty feet wide. Already a shaft fifty feet deep has been sunk, and a tunnel thirty feet in length dug. The ore runs from twelve to twenty

SCENE IN ALBUQUERQUE.

dollars to the ton. One of the best known mines in the camp is the Star, owned by Messrs. Strahan, Thomas and others. It was discovered in August, 1879, and from the first gave proof of great richness. It consists of a free milling quartz ore, and the vein is fully eight feet wide. Assays from this mine have shown from $128 to $164 to the ton. One of the earliest discovered lodes was the Milagros. This was the first to call the attention of miners to Hell cañon, and it has since fully sustained its reputation. Three miles from the cañon is the Golden Chariot lode, a true fissure vein, with well defined walls. North of the cañon are several galena veins found in a granite formation. One of these, the Indiana, assayed one hundred and seventy ounces silver on the surface. It is not claimed for this district that the ore is extremely rich, but that there is an immense quantity of it, and it is easily worked and milled. Water enough to run several mills can be obtained up the cañon and the sides of the mountains are well wooded.

TIJERAS CANON.

Tijeras cañon cuts its way through the center of the Sandia mountains, and has long been the principal route from the Rio Grande eastward. It lies only twelve miles from the river and is connected with it by a fine hard road. The ores are copper, lead and silver. Galena has also been found, some of it rich in silver. This is one of the districts which has just been discovered, but which will soon command attention.

NACIMIENTO

is an organized mining district with a recorders office. For years the Mexicans and Indians have brought very rich specimens of copper ore from the Jemez and Nacimiento mountains. It was known that there was a rich body of mineral there somewhere, but no systematic effort was made to discover it until 1880. A fine property was found on the west side of the Nacimiento mountains. The copper occurs as copper glance and gray copper in the ledges of sandstone. The white and red sandstone runs parallel with the mountain side, and for a distance of ten miles, shows traces of copper. In some places the copper occurs as fossils, mostly of trees, but in others it is in immense lodes of conglomerate. A small amount of silver is found with the copper on the surface, and seems to increase with the depth. The Nacimiento company now own over a dozen claims, on all of which large deposits are found. On the Eureka a tunnel one hundred feet long has been dug. At a distance of fifty feet from the surface a large vein of conglomerate, twelve feet wide, averaging twenty-five per cent. copper, was struck. From that point the tunnel has followed the vein along the dip. This vein can be easily traced for over five hundred feet along the surface, and the indications are that it runs along near the surface for the distance of a mile. The Copper Queen shows a smaller vein, but is much richer. It runs over fifty per

WOOL WAREHOUSE, SPRINGER.

cent., and parts of it as high as sixty per cent. In all of these mines there is an abundance of ore that will run forty per cent. copper. During the last few months, other prospectors have gone into the camp, and over a hundred claims have been staked out. Large veins of fine bituminous coal are found within a short distance of the mines, and wood and water are close at

hand. The Nacimiento company expect soon to have a smelter in operation and be ready to ship bullion by next fall.

The mountains seem to be full of rich veins which only wait the labor of the prospector and miner to be discovered and developed. For the miner and capitalist there can be no better section of country than this.

COLFAX COUNTY.

(*Harry Whigham, Commissioner.*)

Of the mineral productions of this county we have gold, silver, copper, lead, iron, manganese, plumbago, fire-clay and coal. The gold mines are situated in the Moreno valley, and at the head of Ute creek, on the Poñil and on the Cimarroncito. The most important mines in the Moreno are placers. These were discovered in 1868, and have been worked continuously ever since. This district includes many rich gulches, of which the following are the most important: Willow, Humbug, Grouse, Michigan and Big Nigger. These have all been worked by hydraulics with great success. There is on the bars between the gulches and in the valley of the Moreno a vast area of land which has not been worked, all of which prospects fully 50 cents to the cubic yard. Numerous lodes of gold quartz have been discovered in this district, but few developed to any great extent. The water for working the placers is brought principally by a large ditch from the head of a neighboring stream in the Sierra Madres. On Ute creek there are also rich placers which have been worked since 1869. But the principal mines in the Ute creek district—which is divided from the Moreno by the Baldy range of mountains—are the quartz lodes. Chief of these is the Aztec, which was discovered in 1869, and worked the following year with a yield of some six or seven hundred thousand dollars. It is a good vein of free milling ore. There are a number of other lodes which have been worked for years past, and some recent discoveries which promise well. Principal among the latter are the Rebel Chief, Mountain Queen, and discoveries at the head of the Poñil and on the Cimarroncito. The two former are gold quartz. On Poñil the ores run 50 per cent. in copper and high in silver and gold; they are veins about three feet thick and are regarded as important discoveries. On the Cimarroncito a number of gold lodes have been discovered, and it seems more than likely that this may prove an important district. There is a 15-stamp mill at the head of the Poñil owned by the New Mexico and Rhode Island Mining Company. The aggregate yield of gold in this county since the discovery in

1868 is variously estimated between two and three million dollars. Mining here is regarded as but in its infancy, and there is every confidence that the future annual yield will greatly exceed the past.

In the vast area of its coal beds, however, we think Colfax county will find in the future its greatest commercial importance. (See general article elsewhere upon the coal fields of New Mexico.)

DONA ANA COUNTY.

(*A. J. Fountain, Commissioner.*)

The mining industries of Doña Ana county have recently assumed an importance that dwarfs all others. It has been known for many years that valuable mineral deposits were contained in all of its mountain ranges, but their extent and richness was not until recently suspected.

THE ORGANS.

The Organ mountains lie about eighteen miles east of the Rio Grande. The district at present is ahead of any in the county in the amount of development work and prospecting being done. All that is now needed to place the various mines on a paying basis is a couple smelters, and it is very probable that they will be erected within a few months.

The principal composition of the mountain mass in sight at the different elevations, and as shown by the line of breakage discernable at points varying in distances, is syenite doloritic limestone proper, and is combined with other minerals, sandstone, arbolite and porphyry, with now and then talc, porphyry and quartz in mass; and in several places it bears evidence of having undergone a roasting, the residuum filling the surrounding cavities. Again, the usual combination of quartz and feldspar, that in the different localities are more or less mineralized, from the cap rock of the clearly defined veins that ramify the mountain mass, extending from the summit to the plain on either side of the mountain, within the mineral belt range proper, for such these mountains have, for a distance of at least twenty miles long and six wide, counting from summit to each side of the mountain plain.

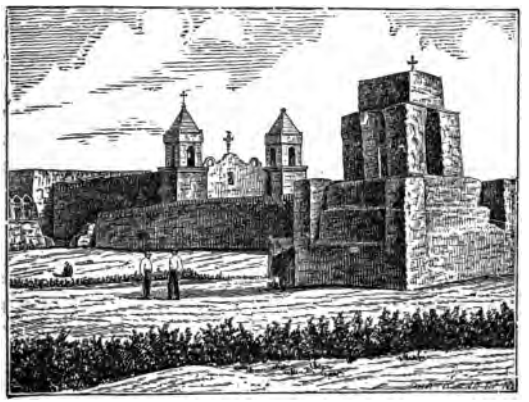
These mountains have a coal formation in the upper cap of the wavelet before named, that can be tapped several times in three miles, and then has its incline under the plain.

The following are among the best known properties in the range on which work is now being steadily prosecuted.

The Hawkeye has a shaft down about thirty feet and shows white quartz with antimonial silver, galena and sulphurets of iron. It has a vein of about two-and-a-half feet in width, following the lead with a black wall of syenite. The ore is said to assay from $100 to $350 in silver.

The Memphis is in lime formation. The main shaft, No. 1, at this examination is one hundred feet deep. It has a cross-cut of fifty-three feet running west, eighteen feet all in ore. At the 100-feet level a cross-cut is being run, one is now in thirty-four feet. The ore vein on the west side of the wall is perfect, pitching five inches to the foot. On the east of the wall it is all in ore and its quantity is unknown. The mine is not yet in shape that a computation can be made. The character of the ore is very flattering for developing into a good paying mine. The ore of this mine is copper stain carbonates and galena, carrying silver. It is said assays have been made of this ore varying from $40 to $200.

The Modoc and the south extension of the same lode, called the Lebanon, are claims which show up good ore bodies, consisting in part of galena, carrying silver, copper and a little gold. The Modoc has a tunnel projected sixty feet in the mountain mass, which is now thirty feet from the summit, with contact well defined, and has every appearance of developing into a good mine.



SHRINE AND CHURCH, SANTA CRUZ.

The Stevenson mine is an old one, but at this time no work is being done upon it. As an evidence of its early use, in the long ages past, not far from the Modoc and to the southeast, is an old ruin, with walls about two feet high, showing that at

least a four-room house had an existence, and near this are the remains of an old smelting furnace, and around it is found a quantity of antimonial silver. Nothing like it has yet been found in these mountains; so the inevitable conclusion follows that the source of this mineral is undiscovered, if in these mountains, or else the ore was imported from some far off district, yet unknown.

The Merrimac is situated one mile and a half north of the Hawkeye and three-fourths of a mile east of the Sylvia. It is said to be one of the best leads in the district, and is claimed to carry sixty per cent. copper and sixty-six ounces of silver. It has a fissure vein with syenite walls on one side and limestone on the other, and has an eight-feet development shaft. The matrix has in it iron, silver, oxide of copper and galena.

The Black Hawk, on the northern part of the mountains is an incline shaft of about forty-five feet, following the vein dipping to the northeast in a fissure, mineralized all the way. The shaft is five by six, copper indications. They claim to have an assay of two ounces gold, $50 silver, and two per cent. copper, i. e., $100 of the copper per ton.

On the south end of Mineral Hill, on the east side of the mountains, and about eight miles north of Shedd's ranch, are a series of claims called the Uranus, Vulcan, Lady Hopkins and Pocotiempo. All these claims have a heavy iron capping, and carry both gold and silver. There are now several shafts in about ten feet, but preparations are being made to run a 300-feet tunnel to bisect and cut the several veins that cross the mountain and also through the several claims.

It will not be very long before capitalists will be directing their attention to these mountains, and with one or two good mills in operation, Las Cruces and Mesilla will become thriving places.

LAKE VALLEY.

Considering the amount of development, the Lake Valley mining district certainly has as flattering an outlook as any in the Territory, and is located in the foot hills of the Black Range, upon its southeastern slope, twelve miles northwest of Nutt Station, on the Atchison, Topeka and Santa Fe railroad, said station being twenty-seven miles north of Deming. The general formation of the district is fossiliferous lime streaked with strong strata of porphyry, and the pay material seems to be cased between lime and porphyry, the contact showing more perfectly where the greatest depth is attained. Of the ores, an iron carbonate strongly impregnated with chlorides and sulphides of

silver predominates, though lead, carbonates, antimonial lead and antimonial silver are found in considerable quantities. The entire precious metal-yielding area of this district does not embrace a space of over two miles square, and decidedly the best portion of this is covered by the claims of the Sierra Grande, Sierra Bella, Sierra Plata and Sierra Apache companies. Although these four companies are separate corporations, the leading lights of all are the same men, and who in mining affairs have a national reputation.

Among the entire list of properties, probably the Lincoln of the Sierra Grande, shows the greatest amount of development, and contains in sight the largest bodies of ore, actually measuring in places twelve, fourteen and sixteen feet of very high grade ore.

Next in point of development are the Stanton of the Sierra Plata, and Columbus and Emporia No. 2 of the Sierra Bella companies. All of these show vast bodies of ore equally as rich and almost as large as those of the Lincoln. The Kohinoor of the Sierra Apache, although not as much developed as the above described claims, shows upon the surface even more flattering than any of them. There are at least two thousand tons of ore upon the dumps of these properties, all having been extracted from the drifts, cuts and winzes, (no stoping being done), and its estimated value made from close samples and tests, is far in excess of the original purchase money, which is popularly supposed to have been $500,000. Numbers of leading mining experts have recently examined these properties, and it is stated that none of them have estimated the ore reserve to be seen, at less than $5,000,000.

The ores of these properties are assorted into about six classes, running less than 40 ounces of silver per ton, and, marvelous to relate, large proportions of it reaching, 5,000, 10,000 and even 15,000 ounces of silver per ton.

After a great many working tests it has been determined that at least ninety per cent. of the ore of these mines is free milling, consequently a large force of men are employed in grading space for mill platts, and machinery is being purchased to arrive at an early date.

Thus, twelve miles northwest of Nutt Station, at Lake Valley, in Doña Ana county, New Mexico, is situated the grandest deposit of silver ore ever discovered. In comparison with it, the treasure which the genii of the wonderful lamp and ring laid at the feet of Aladdin sinks into insignificance; and the story of the Peruvian Inca, who filled his prison cell with precious metal to satiate his relentless captor's avarice, will no longer

pass for fable when the wealth of this marvelous mine becomes known.

THE DISCOVERY.

A little more than three years ago a miner by the name of Lufkin, then living at Hillsboro, New Mexico, fifteen miles northwest of Lake Valley, or McEvers' ranch, as it was then called, in company with a companion, started out on a prospecting trip in the foot-hills of the southern extremity of the Black Range. They had no luck for some weeks; but finally, at a point about two miles west of McEvers' they discovered a large body of black ore croppings extending over a hundred acres of Territory and indicating plainly the presence of mineral of some kind. The big, black bodies of ore, cropping out above the surface, showed that, whatever the nature of the mineral to be found, it was certainly in immense quantities. They sank several prospect holes and soon satisfied themselves that they had "struck it rich" in silver; but, as their "grub stake" was by this time exhausted, they returned to Hillsboro and got employment, one as a cook and the other as a miner, saved up their wages for several months, in order to have a "grub stake" when they should go again to work on their claim.

In a few weeks the Indian war broke out upon the country and mining operations in that section were suspended. Finally, however, through the assistance of Hon. J. A. Miller, of Grant county, N. M., who was then the p st-trader at Fort Bayard, Lufkin and partner were enabled to develop their mines sufficiently to prove that they were first-class; and then a rush began towards the new district. Claims were located on all sides and quite a mining camp sprung into existence. Ore running as high as $1,000 per ton was exposed, and Mr. Miller began to look around for means to better develop the mines. The result was that about a year ago Mr. Miller effected a sale of the principal mines in the district to a syndicate of New York capitalists for $225,000, Lufkin and his partner receiving $25,000 of the amount.

(Reference has been made on a preceding page to the erection of stamp mills and reduction works which are now in active operation, and for many months [from January 1882] have been almost daily showing an out-put of bullion running up into the thousands.—Ed.)

The present article has already stretched out to undue proportions, and we will only add, in closing, that the history of the world contains no parallel in this New Mexican mine. Not a thousand persons have yet seen it, and probably not one-tenth

as many more will feel disposed to accept without reserve our statements; but they are all true, nevertheless. The rich developments we have described are situated at a point of junction of two claims called respectively the Lincoln and the Stanton by the locators, but now absorbed into the Sierra Plata and Sierra Grande groups by the New York company.

THE JARILLAS.

The Jarillas mountains, now known as the Silver Hills district, are about twenty miles east of Shedd's ranch which is on the eastern slope of the Organ range. They are about twelve miles in length from north to south, and present every appearance of being a volcanic upheaval in the midst of the arid plain, some sixty miles wide, which lies between the Organ and the Sacramento ranges.

The Silver Hills have sprung into fame only since the first of January last, though they have long been known to be rich in mineral and many attempts have been made to prospect and develop them; but owing to the want of water which had to be carried from Shedd's ranch, every effort proved futile.

At length a band of daring prospectors invaded this hitherto inaccessible region, and succeeded in surmounting its difficulties.

The lodes generally extend northwest and southeast. At the south end the capping is mostly iron, in some of its numerous forms. These cappings are gold and silver bearing; but most of the miners think as soon as the cap rock is removed, the principal yield will be gold. This supposition seems to be well grounded as placer gold is found in nearly all the gulches. Some silicious lime is also found in the south. As you pass to the north, the iron capping gives way to that of silicious lime, and the prospect for gold decreases while that for silver and copper increases. But while this rule holds good in the main, like other rules it has exceptions. So we are not surprised to learn that some claims at the south run high in silver and copper.

Several claims have been sold, without development, for $500 each, while others have been bonded at $20,000. Interests have also been sold in some claims at good figures, where the locators were too sanguine to sell outright, but not rich enough to develop alone.

All the ore is impregnated, to a greater or less degree, with copper in its various forms, and yields well in gold and silver. We have had reports of assays running as high as 76 per cent. in copper, and from 15 to 79 ounces in silver. Of gold we have no specific report, but as before intimated the prospect is very

good. It is said that from four pounds of ore from the Refufia mine, smelted in the rudest manner, two ounces of silver were obtained.

A well has been sunk to a depth of ninety feet in Dogtown, about five miles west of Jarillas, at the bottom of which is a bed of sand and red clay sufficiently wet to squeeze water from it with the hand. If this bed be perforated, and sand and gravel found below, water will undoubtedly follow, and probably rise almost to the surface. If so, we predict for the Jarillas a boom such as has not been known since the palmy days of Leadville.

Mining in the Jarillas, prior to the recollection of the oldest visitants, and indeed prior to any well authenticated history of this country, has left its traces in numerous dumps of rejected ore, evidently considered worthless in comparison with that which was probably packed long distances for reduction by the rude methods then known, but which will yield a handsome profit under present modes of treatment and advantages of transportation. The old shafts, or more properly "gang ways," from which the ore has been carried on the backs of peons, have yielded to the mouldering influences of time; and the work of denundation which has been going on for decades, perhaps centuries, has filled them up and almost obliterated from them every trace of human industry. Even the old ore piles were covered with wash from the mountains above, so that they were only found by mere accident. At other places, great excavations have been made for that highly-prized and valuable gem, the turquoise; and, judging from the numerous small specimens found in the old debris not without success, but as civilization advances, the demand for, and hence the value of, mere ornaments decrease, so that it is not likely that it will ever pay again to work these deposits for turquoise.

Some speculative minds believe these traces of ancient mining have been thus obliterated by the pueblo Indians, to keep their Spanish conquerors from using their enforced labor to enrich themselves; while others deem it of more recent date, and claim that they were concealed by the Mexicans about the time of the cession of New Mexico to the United States. But for ourselves, we prefer to attribute the obliteration to natural causes.

THE POTRILLAS.

This is a small range of mountains near the Mexican line, about thirty-five miles southwest of Mesilla. Many valuable mines have already been discovered in this range.

THE SAN ANDREAS AND SAN NICHOLAS MOUNTAINS.

These mountain ranges offer a fine field for the prospector; they are the northern extension of the Organ range, and are known to be rich in valuable mineral. But very little prospecting has yet been done in these ranges; in fact it may be said, notwithstanding the rich discoveries made in Lake Valley, Hillsboro, the Organs and the Jarillas, that the mines of Doña Ana county have not been yet fairly prospected. I have myself with a horn spoon and a canteen of water, washed gold out of the sand in a dozen cañons of the Jarillas mountains, and I am informed by reliable gentlemen that they have done the same in San Andreas range, yet I know of no placer claim having been located in either of these ranges.

The prospector in Doña Ana county need have no apprehension that his mineral discoveries may turn out to be within the limits of somebody's land grant, *for not a foot of mineral land in this county is covered by a grant.*

GRANT COUNTY.

(*From Burchard's U. S. Mint Report, 1881.*)

This county, at present, as for many years, recognized as the principal mineral-producing portion of New Mexico, is situated in the extreme southwestern corner of the Territory. It is very extensive, and beautifully diversified by elevated grassy plateaus, mountain ranges and peaks, and fertile valleys. The first discovery of gold made in the county was in 1859, near Pinos Altos, about nine miles north of the present site of Silver City, the county seat, and for several years thereafter from 1,000 to 2,000 men were actively engaged in gulch mining at this place. The placers are represented to have been very rich and of considerable extent. Washing is still carried on upon a small scale by persons without capital, Mexicans principally, who manage when not prevented by a scarcity of water, to make good wages at the work. In addition to gulch mining, much work has been done on lodes, and many good mines have been located in the mountains contiguous, among the most important of which are the following, viz: Pacific Nos. 1 and 2, Aztec, Asiatic, Chicago, Langston, Mountain Key, Lamiena, Grande, Arizona Nos. 1 and 2, Mogul, Atlantic, Victoria, Helen's Lode, Martin and Helen's Extension. Many smaller veins have produced rich ores, but are now either worked out or can no longer be made to pay, owing to a change in the character of the ore, to iron pyrites and sulphurets, for the reduction of which the owners do not possess proper facilities, their machinery having hitherto

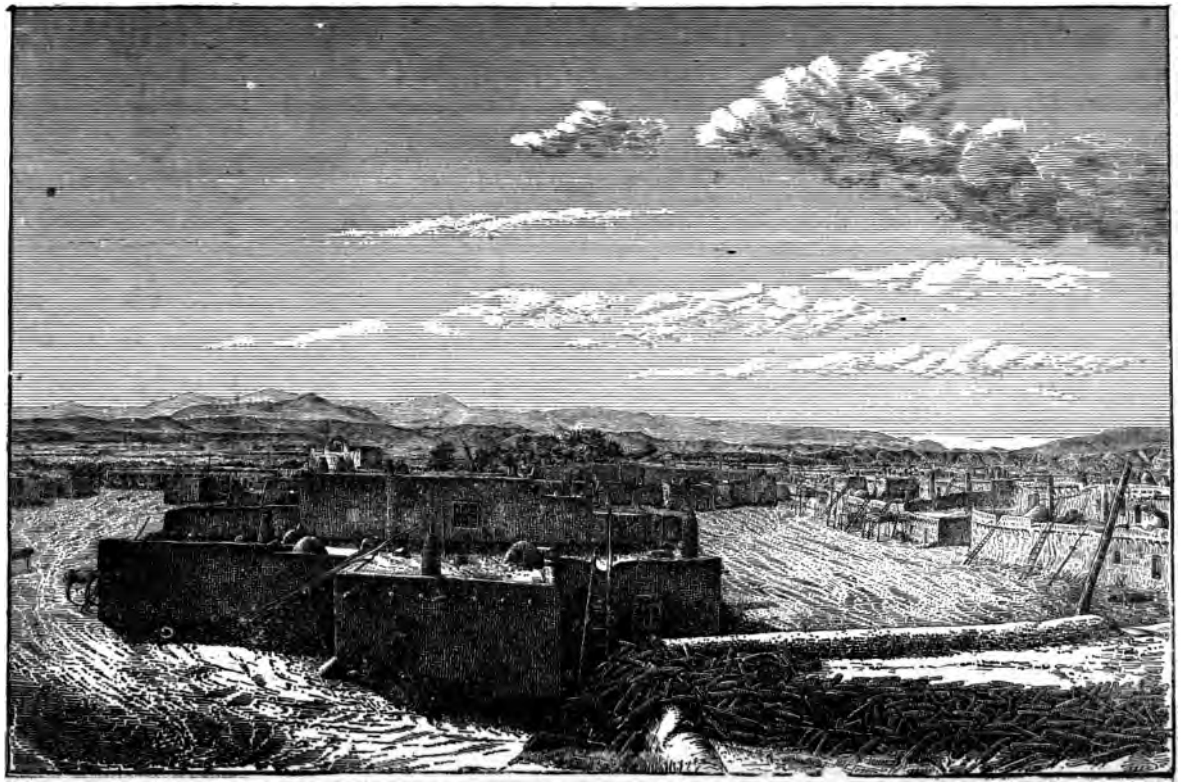
been confined to the arastra, which was found to work well in the soft surface ores. In fact nearly all the mines in this locality are said to be in about the same condition, and the owners are now awaiting the advent of capital to furnish the necessary machinery to once more transform the camp into the busy community it was during the prosperous times of 1859 and 1860. The amount of gold produced here during the year 1881 was about $25,000, about equally divided between gulch and lode production.

The entire production of the placers since their discovery is variously estimated at from $5,000,000 to $10,000,000 in value. A few persons estimate a still greater amount, but the probabilities are that the smaller amount is excessive. The mines mentioned are reported to have produced about $1,500,000 during the same period.

There is no record of the discovery of gold, in any considerable quantity, in any other portion of Grant county, except in the Mangos Valley, near the Burro range of mountains, where gold-bearing rock of high grade and in large quantities has, at a comparatively recent period, been discovered. A number of mines have been located in this valley. But little development and no output have thus far been made. The locality belongs to the Mogollon range of mountains, which have long been known to prospectors to be rich in mineral resources, besides being well supplied with wood and water. A railroad from the town of Socorro, on the Rio Grande, is expected at an early day to penetrate this region, when it is confidently believed this portion of the Mogollons will develop into a rich mining district.

CHLORIDE DISTRICT.

Numerous valuable silver mines have been worked for many years in the vicinity of Silver City, and have produced large quantities of bullion. Among the most prominent are the Seventy Six, Providentia and Two Ikes. No labor other than "assessment work" has been done on the latter or any of the smaller mines of "Chloride Flat" for a year or more past. The Providentia and Two Ikes are still, however, regarded as very valuable mines, the surface ores having only heretofore been removed, and work on them has been suspended largely on account of the expense of deep mining, and the lack of capital to supply the necessary machinery. Before the opening of the Seventy-Six mine, these two furnished sufficient bullion to supply the wants of the entire population for a number of years. This was before the day of careful statistical records. The value of the production can therefore only be estimated. A low



SAN JUAN INDIAN PUEBLO, D. & R. G. R. R.

estimate of the Providentia puts the amount at $350,000, and that of the Two Ikes at $300,000.

The Seventy-Six is a well developed mine, having a shaft of about 200 feet in depth, and drifts in various directions to the extent of nearly 12,000 feet, in all of which there are said to be bodies of fine ore.

The entire yield of the mine, as shown by the books of its owner, has been $1,260,000 during the twelve years it has been actively worked. The mine produces some very high grade ore; specimens, weighing hundreds of pounds, giving assays of 3,000 and 4,000 ounces to the ton, but when so found it is very refractory.

Connected with this property is a 10-stamp mill, somewhat out of repair by reason of long service, but the new management will no doubt soon put it in thorough order and fit it with all the modern appliances for the treatment of ores. There is a second mill at this place, of like capacity and in good order, owned by a Wisconsin company, but it has done little or no work during the year. The cause of this is not plain, as the supply of water has been better than for years past, and the mines of the locality are said to be able to produce more ore than both mills could treat. The district has no smelter at present, and yet it would seem that one might be made to pay, as plenty of rich ores are produced that can only be successfully worked by the smelting process.

In connection with the Seventy-Six, and now a part of that property, there is another mine, the Seneca, which has been a good producer in the past, but which has not been worked for several years. Its total production is reported at about $92,000 worth of bullion.

As in the case of the gold production of Pinos Altos, and for the same reasons, it is difficult to say to what points this bullion has been shipped. The following is an estimate made by the owner of the mines, and is believed to be as nearly correct as it can be made, to wit:

To New York	$750,000
To Santa Fe	175,000
To old Mexico	250,000
Sold in Silver City	85,000
Unknown	90,000

Of the above bullion sold in Silver City and "unknown," probably the greater portion was shipped to New York, as the banking firms of Messrs. Porter and Crawford, of Silver City, who have been heavy purchasers of the precious metals for many years, have shipped, of silver alone, about $1,175,000 to their New York correspondents. Aside from this firm there are

about a half dozen others that have been extensive dealers, and whose shipments have generally been made to that city.

Of the large amount represented as shipped into old Mexico, it is reported that the bullion was exchanged for supplies, such as cattle, corn, meal, beans, &c., necessary for the support of the population.

GEORGETOWN DISTRICT

is the next silver mining section of Grant county in the order of importance; in fact it is a question in dispute whether it does not take precedence. It is almost due east of, and about 25 miles from Silver City. The discovery of silver at this point was made in 1872, since which time it has been thoroughly prospected, and many good mines have been opened, of which the following are among the best: Naiad Queen, McGregor, McNulty, Satisfaction, Satisfaction Extension, Commercial, Potter, Lou and Casey. There are many others of less note on which only assessment or development work is being done, but most of these named are being actively worked, and yet not to their full capacity, it is said, owing to the expense attending the reduction of their ores. Only the higher grades have thus far been treated, for this reason, while large quantities of low-grade ores, running from twenty to thirty-five ounces to the ton, are left in the dumps of the respective mines.

The Mimbres Mining company has two stamp mills on the Mimbres river, about three and one-half miles from Georgetown, where the greater portion of the ore produced is reduced. One of these is a 10 and the other a 5-stamp mill. The former is nearly new and has a capacity of 25 tons per day of twenty-four hours. This mill is supplied with all the modern improvements, and is run by either steam or water power. This latter cannot, however, be relied upon, as at times the ditches and dams are destroyed by freshets, while at other periods the volume of water is so depleted by irrigating acequias and by evaporation, as to render steam, as an auxiliary, necessary. The other mill is old and worn, but still effective and capable of reducing about eight tons of ore per day. In connection with this mill there is a rude Mexican furnace and smelter used for smelting concentrations and ores that cannot be properly treated by other processes.

The large mill of the company was in operation only one hundred and eighty days during the year, owing to the causes mentioned, but notwithstanding the difficulties and obstructions encountered, the output of bullion for the year, as ascertained from the company's books, amounted to $250,000 in value.

The output of the McGregor for the calendar year 1881, was $20,000, and for the entire period from 1873 (when discovered) to December 31, 1881, about $225,000.

The total production of the district of Georgetown, since the first discovery of silver, is estimated to amount to $1,500,000 in value, believed to be a conservative estimate, arrived at by aggregating the known shipments made by the different producing mines and mills.

The mines of this section are reported by experts to be very rich in medium-grade ores, and the output of the future, if the processes of treatment become sufficiently cheapened to warrant the working of the lower-grade ores, will no doubt far exceed that of the past.

The deepest shafts of the mines of the district have only attained a depth of about 300 feet; it may, therefore, be regarded as only in a partially developed state. Of course nothing can be predicted as to what results may follow from deeper workings, but the mine owners are confident, and it may reasonably be inferred that the camp will be a prosperous one for some time to come.

BURRO MOUNTAINS.

Valuable discoveries of rich silver lodes have, within a recent period, been made near Bullard Peak, of this range, which is some 20 miles southwest from Silver City. A great deal of prospecting, and some development work, have been done, and the explorations have induced many to believe that this will develop into the richest mining section of Grant county.

The Blue Bell mine has been worked to a greater extent than any other prospect of the range, and has a shaft 45 feet deep, on a vein 2 feet in width, which is said to be a perfect network of wire and plate silver.

The Silver Glance and Black Hawk are more recent discoveries, and the indications are that they will prove even richer than any of the prospects yet developed. A piece of ore weighing fifteen pounds is reported to have been taken from the Black Hawk, three-fourths of which was solid silver. Assays running as high as $15,000 to $19,000 per ton are well authenticated. In fact, native silver, in wire form, has been found in a number of the prospects, and while it is not claimed that quantities of this ore abound, still enough has been found to indicate the discovery to be a very valuable one.

As yet there has been no output of bullion from these mines. In fact, the camp is so new that no reduction works of any kind have yet been completed. In the Stevenson sub-district of this

range a smelter is now being erected for the treatment of the ores of its mines, which are generally high-grade copper carrying a fair per cent. of silver. This range of mountains is well wooded and has a plentiful supply of water, which will insure, in time, the building of mills and other works.

In the south and east end of this range are located the sub-districts of Givens and Cow Springs, which on account of the free milling character of the ores found, and the extent of their mineral-bearing area, promises to become productive. In addition to these and almost in the same general locality, being a little south and almost between the two, discoveries of sand carbonates have lately been made which give assays from surface sand of $24 to the ton. The ease with which these ores can be mined and reduced will make this discovery valuable.

SHAKSPEARE, OR VIRGINIA DISTRICT

is located about 25 miles southwest of the Burro Mountains, near the line of the Southern Pacific railroad, and in the Pyramyd range of mountains. The mineral-bearing area is about 20 by 8 miles in extent, and is said to be very promising.

The Superior has been opened by a shaft to a depth of 185 feet, and drifting along the vein in both directions has been commenced at the 100-foot level. The vein is of a uniform width of five feet. The mine is reported to have 1,000 tons of ore on its dump, smelting returns of which show $66 to the ton.

The Atwood is developed to a depth of 115 feet and shows on its dumps a large quantity of ore of the same character as that of the Superior, but mill returns indicate that it is considerably richer, $130 to the ton being reported.

In point of development the Last Chance takes precedence over the rest, it having over 1,500 feet of shafts and driftings. In some of the levels fifteen feet of ore are exposed, and the veins, it is said, will average six feet throughout the entire mine. There are estimated to be 2,500 tons of ore on the dumps, and a number of car loads have just been sent to the smelting works at Pueblo, Colorado. Returns are reported as averaging $70 per ton. The ore is argentiferous galena in character, carrying chlorides and native silver.

The Viola is on the same vein as the Last Chance, and while it doubtless is a very valuable mine it has not been so extensively developed. It has several shafts, the deepest having attained a depth of 135 feet. Sufficient drifting has been done to show a five foot width of ore, similar in character to that of the Last Chance, but richer in native silver. Ores have been shipped to smelters, but returns have not been received.

A smelting and refining company is now erecting smelting furnaces and reduction works for the treatment of all kinds of ores. The work is being pushed as vigorously as possible, and the company will be ready at an early day to commence work. Already a price-list has been issued and the purchase of ores at their assay value will commence within a short period.

LORDSBURG DISTRICT

is adjacent to the Shakspeare, and is located on an open, grassy plain, with no surface surroundings to indicate the mineral deposit, which was accidentally struck by the railroad company in boring an artesian well. The character of the ore is said to be sand carbonates, being entirely different from those of Shakspeare, only two miles distant. In boring to a depth of 425 feet, the drill is reported to have passed through nearly 300 feet of this deposit. At this depth, water was struck, and black sand was forced to the surface, which upon examination showed rich traces of gold. An effort was made to keep the discovery secret until its true value could be determined, in order that the whole might be appropriated by the few privy to it. This effort was partially successful.

The work of developing the discovery has now been under way for some time, and parties interested seem perfectly satisfied with the result. At a depth of about 125 feet, where the ore body was first penetrated, assays made showed the value to be $3, $12 and $15 per ton.

Every foot of ground was staked off as soon as the discovery became known, and companies were at once formed to develop the deposit. A shaft was commenced at a point some 70 feet distant from the original drill hole. This shaft is double compartment, 6 by 10 feet, and has reached a depth of 150 feet. A stringer of ore running into the shaft is known to have been encountered, and indications are so favorable that the superintendent is said to have bonded a number of adjacent claims to eastern parties. The assay value of the ore found was kept a profound secret.

There are adjoining claims, parallel to each other, and lie across the railroad track. On the Lordsburg, the shaft is 5 by 7 feet, and has been sunk to a depth of 151 feet. It is located about 500 feet south of the railroad. At a depth of 117 feet ore was struck, an assay of which showed $4.58, $22 and $172 and an assay at the bottom of the shaft, which is said to be in an ore body of unknown dimensions, yielded 78 ounces of silver to the ton. Drifting, to ascertain the extent of this deposit, will not be commenced until a depth of 250 feet has been attained. At

the same time the ore body was struck water was encountered, which has become too strong too permit of the work going on with the present hoisting apparatus; it has, therefore, been temporarily suspended to enlarge the capacity of the hoisting and pumping works, which will be completed in a few days. The formation is peculiarly strange, and the rock has no mineralized appearance. The stratifications cross each other in every direction. The ores thus far found are free milling, but it is believed they will finally become smelting in their character.

THE SAN SIMON AND GRANITE GAP DISTRICTS

are located in the Stein's Peak range of mountains, 25 miles west of Shakespeare, and from 5 to 10 miles south of the Southern Pacific railroad. Both districts have been somewhat developed, and the latter especially has produced some very good smelting ore, but until reducing works are erected it is not likely that any extensive development will take place in either district, as the ores are hardly rich enough to bear transportation over rough roads any considerable distance for treatment.

STEEPLE ROCK.

This is a new district, near the border of Arizona, in the northwest corner of the county, and about 15 miles north of the Gila river. It covers an area of about 10 miles square. The ores are said to be uniform in character and of high average grade, principally of gray copper, silver glance, horn and brittle silver, and black sulphurets. The pay streaks occur in a porphyry formation, and run from 5 to 18 inches in width.

The Eagle is the most important development of the district, and shows a solid ledge of 5 feet, with an 18-inch pay streak.

The Rappahannock, the southeastern extension of the Eagle, shows a vein of like character, within which is another 2 feet wide, of soft carbonates of copper, with kidneys of peacock copper, from which assays of 260 ounces of silver and 68 per cent. of copper to the ton are reported.

The Maud S., is another promising claim, which has produced ore that assayed $200 to the ton. A contract has recently been let for the sinking of a 100-foot shaft on this vein.

Three miles to the northwest of these locations is the Carlisle, a gold mine which is reported to have a ledge 40 feet in width, from which assays running as high as $15,000 to the ton have been had.

This district is located in what are known as the Gila mountains, which are a part of the Mogollon range referred to in notes on the Mangus Valley discoveries.

VICTORIA.

This is a small and compact district, located about 2 miles from the village of Gage, a station on the Southern Pacific railroad. The ores of the district are principally sand carbonates of high grade, and are reported to exist in large quantities.

EUREKA

is another small district, located near the railroad, which is reported to be a producer of rich ore. The erection of reduction works has been contemplated for some time, and but for the lack of capital a smelter would now probably be in blast at this place. A contract has been made with the Atchison, Topeka and Santa Fe road for the transportation of a car-load of ore a day from this place to the smelting works at Pueblo, Colorado.

LONE MOUNTAIN.

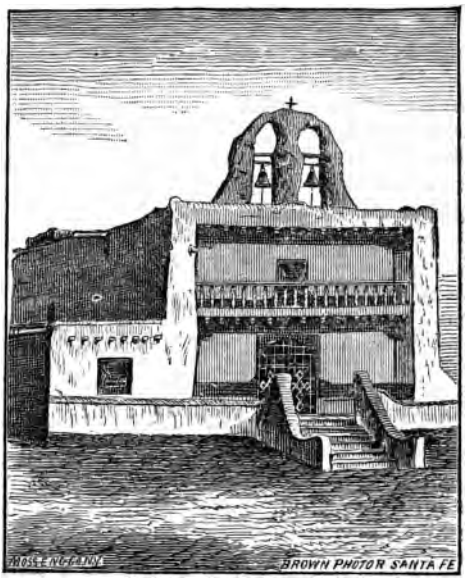
This is comparatively and old mining district, and is located about 7 miles from Silver City, a little south of east from that point. The most important mines at present are the Crozet and Walker. The mineral-bearing area is still being prospected and developed, with hopeful feelings. The ores are similar in character to those of the mines of Silver City, and sometimes streaks are found of extraordinary richness. Two steam mills at this place, one of 10 and the other of 5-stamps, have been running at irregular intervals during the year. They are, however, sadly out of repair, and their usefulness is nearly over. The production of bullion for 1881 is reported at about $10,000, and for the entire time, since the first discovery of the district, about $100,000 in value.

CENTRAL CITY

This district is nine miles from Silver City, and situated on a flat or mesa leading down from the mountain in which are located the celebrated Hanover and Santa Rita copper mines. These mines cover a space some five miles in length from north to south, by half that distance in width. Granite is the predominating "country rock," interspersed with limestone and slate. The country is covered with a thick growth of pine, piñon, cedar, and oak. The entire table is checked with gold and silver-bearing leads, and the numerous ravines cutting through the flat furnish an unfailing supply of the purest mountain water.

Here are found inexhaustible bodies of low grade ore mostly gold-bearing, and now that mills and other works for reducing low grade ores are being erected in the county these mines are attracting considerable attention. There are thousands of tons

of ore in the district that will pay from $10 to $40 per ton, and the day is not distant when Central City will be one of the most important and thriving mining districts in New Mexico. These bright prospects have started up a considerable work and a number of companies are sinking shafts.



SPANISH MISSION CHURCH OF SEVENTEENTH CENTURY.

SANTA RITA COPPER MINES.

Of all our Territorial acquirements from Mexico, no portion has attracted so much attention, so much worthy interest, or possessed such historic fame as the copper mines known as Santa Rita del Cabres. This camp is located five miles east from Fort Bayard, which lies between the town of Central City and the copper mines, and is really in the district of Central City.

The mines were discovered by Lieut. Col. Carrasco, of the Spanish army in 1800, through the medium of a friendly Indian. Col. Carrasco, not possessing the means to work them was assisted by Don Francisco Manuel Elguea, a wealthy merchant of Chihuahua. In the beginning of 1804, however, Col. Carrasco sold the mines to Señor Elguea, who immediately commenced working the property extensively, and on his first shipment of copper to the City of Mexico, was enabled on account

of the extraordinary quality of the metal to make a contract with the Royal Mint for the purpose of coinage for the full annual product of the mines. The copper was transported from the mines to the City of Mexico, a distance of 1,000 miles, on pack mules to Chihuahua, from thence by wagon. One hundred mules, carrying 300 pounds each, were continually employed.

While the Santa Ritas are undoubtedly the richest deposits of red oxide of copper known, they are strictly the most peculiar and really singular copper mines of the world. They are not veins or lodes. But in sinking a shaft the miner continually meets with veins of sheet copper (native) from one-eighth of an inch to two inches thick all through the country, or white porphyry rock. Again he frequently meets with boulder or nugget copper in lumps weighing from 20 to 150 pounds. These lumps are kidney shaped, and by the miners called kidney ore.

These mines appear inexhaustible, and now bid fair to become more famous than in ancient times; for there is a stir in the camp at present which indicates earnestness. A new superintendent with a large force of men has arrived.

LINCOLN COUNTY.

(*Commissioner Dolan.*)

The mountain ranges are along the western border of the county, running north and south.

White Oaks is the center of the mining section. Considerable has been done towards opening the mines in this region. Capital has just begun to take an interest in development, and from what has been done so far the mines promise to be a source of great wealth to the country.

The famous Homestake mine is situated in this camp, and with the mills now nearly ready for operation, it is expected large quantities of gold will soon be produced from this and other valuable properties in the district.

There are several mining camps in this county. In close proximity to White Oaks, are the Nogal, Vera Cruz, Jicarilla, Gallinas and Rio Bonita, that promise rich results of treasure as soon as means are provided for their reduction, and it is expected that another rich mining section will soon be open to occupation by throwing open a part of the Mescalero Apache Indian reservation and which will also open an extensive agricultural and grazing section.

Lincoln county has an additional source of wealth to all the above in her extensive coal fields. In the region of White Oaks there are large bodies of coal, of a superior quality for cooking,

and aside from the demand for it for purposes of reducing ores, the Texas Pacific railroad is from necessity obliged to build a road to these coal fields to supply the demand for their own consumption; and the Atchison, Topeka and Santa Fe railroad is also reaching out its line of road to avail itself of the rich deposit.

In addition to the coal the mountains are heavily timbered with pine, spruce, piñon and cedar, and an abundance of lumber for building and other purposes can be readily obtained.

MORA COUNTY.

(*Commissioner Kroenig.*)

The mineral wealth of this county is believed to be enormous, but being on the "Mora grant" is thus far undeveloped; alluvial gold has been found in various places, also silver, copper, antimony, iron and coal. A coal oil spring has recently been discovered twelve miles from Mora, the county seat of the county.

RIO ARRIBA COUNTY.

(*Commissioner Eldot.*)

Now a few observations concerning the mineral wealth of New Mexico, and especially of Rio Arriba county. Writers of late, have so expatiated upon the mineral resources of their respective counties and districts, that the financial world regards with distrust any statement in the slightest degree tinged with enthusiasm. How far this distrust may be justified it is not for the writer to say, but knowing its existence and fearing to arouse any suspicion of good faith by indulging in a rosy-hued narrative of the mineral veins of Rio Arriba county, he prefers to let the subject pass, without any attempt of a detailed description. The mineral veins of Rio Arriba county speak for themselves in tones more eloquent than pen can command. The citizens of Rio Arriba county have not been desirous to organize a mining boom, but it may be said, that for the man of moderate capital and good business qualifications, no better mining inducements can be found in any country than those this county has to offer. Our mountains contain illimitable treasures, in the shape of lead, iron, copper, silver, mica, and gold, and in the near future this beautiful county is destined to be known throughout the civilzed world as the second and greater California, the true Eldorado of the universe. Rich old mines are found in almost every direction. Some of these mines were worked centuries ago by the Spaniards, as the remains of their old works and smelters

MEXICAN GRAIN MILL.

testify. The old shafts have been filled up, however, as is true of all the mines which were worked previous to 1680, by the native Indians, who had been made to work them under conditions of great hardship, and after thirteen years rebellion the Spaniards were only able to regain their ascendancy by a compromise with the native races, the chief feature of which was, that there should be no mining done in the Territory. Where millions were once taken out of these mines with the aid of rude machinery and an imperfect knowledge of mining; with our improved machinery and better knowledge of mining it is not going too far to say, that we may be able to extract other untold millions.

Baron Von Humboldt, said that "the wealth of the world will be found in New Mexico and Arizona," while another writer made the following remark: that "while the mineral wealth of New Mexico has not been developed, it is an established fact, that the mines of Montana and Colorado on the north, Arizona and California on the west and Old Mexico on the south have been developed rich in gold and silver."

"The geological formation is such that New Mexico must be rich while the evidence of history shows this Territory to have been a rich mining country, when the New England colonist was struggling for existence with the Indians. The simple

fact is, that New Mexico in the near future will develop into the richest mining country in the world. The surface indications of the mines of New Mexico, are far superior to those of Colorado, Montana or California, while in every instance the deeper the shafts have been sunk in the mines, the richer the ores." According to ancient and authentic documents, the diezmo or tenth part of what was annually extracted from a single old mine in this same county, amounted to several million dollars, and there is no doubt that this Territory will soon be recognized by all nations of the globe as the great treasure house of the entire universe.

The coal mines at Almargo, 25 miles northwest from Tierra Amarilla, are at present putting out about 225 tons of first-class bituminous coal per day.

PLAZA HOTEL, LAS VEGAS.

SAN MIGUEL COUNTY.

(*Commissioners Koogler and Prichard.*)

The minerals found in this county are similar to those found in many other portions of the Territory, and constitute, mainly, gold, silver, copper, coal and iron. The mineral wealth of the county is already an assured fact, and by judicious investment and management, within a comparatively short time the yield from precious metals will be enormous. Our mountains are almost wholly unexplored, but so far as prospecting has gone, the results have been surprisingly flattering.

Gold can be panned from the sands of any of the streams and arroyas running down from the mountains. Gold and sil-

ver-bearing veins have been recently discovered in the Tecolote mountains, twelve miles from Las Vegas, and work is being pushed rapidly and systematically in their development. Several mining districts have been organized known as "Mineral Hill," "San Carlos," "Sweepstake," "Blue Cañon," etc. The ore carries silver and gold principally, and although generally pronounced low grade, with occasional exceptions, is abundant and easily accessible The miners in these districts are sanguine, and steps have been taken looking to the introduction of machinery for treating these ores. A large vein of copper ore, having some silver and gold, has recently been discovered in these mountains and traced for many miles. These discoveries are just west of the Tecolote river. Still further west, however, in the mountains along the Pecos river important discoveries of mineral have been made recently. The discoverers are quite enthusiastic over the finds, and old miners and experts pronounce them to be as rich mineral prospects as have yet been found in New Mexico. The facts are that the mountains are mineral bearing throughout, and all that is required is a thorough investigation to demonstrate beyond a doubt the great value of the deposits. Good indications of mineral exist, above and near the Las Vegas Hot Springs, Rincon, del Tecolote, Sapello and various points. Float native copper has not only been found in the mountains, but likewise down the Pecos as far as Santa Rosa, and also in the arroyas in the vicinity of Fort Bascom. So far as the mineral in San Miguel county is concerned it is a virgin field known to exist, but little prospected.

OUTFITTING HOUSE, OVERLAND TRADE.—1820-1883.

But little attention was given to it previous to the advent of the railroad, a little over two years ago, as stock raising, mercantile pursuits, and trade engrossed the whole attention of the people and was found remunerative. Now, however, prospecting is industriously prosecuted by a few with good results. Coal has been found in various places in this county, and of good

quality. The supply will be equal to the demand in the near future, and as these coal fields are in close proximity to Las Vegas, where its consumption is greatest, fuel will be hereafter materally cheapened. The mica industry promises to be of considerable importance in this county. The value of good mica mines is too frequently underrated or not understood. Good mica is always a marketable commodity. In fact, the demand is always greater than the supply. There are very few localities indeed where marketable mica is found. New Hampshire and North Carolina furnish about all the mica that is sold in our markets not shipped from abroad. Mica is worth from 50 cents to $8 per pound, the price between these sums depending upon its clearness, toughness and size. Some of the mica now being taken from the table lands are of excellent quality.

INDIAN POTTERY.

SANTA FE COUNTY.

(*Commissioner Greene.*)

The districts in which the greatest amount of work has been done and which are rapidly attaining celebrity in the mining world—the Los Cerrillos and the New Placers—are situated in the southern part of the county. Of the mineral resources of

the ranges to the north but little is known, as no prospecting of any amount has yet been done there.

BONANZA CITY.

This is the first of the Cerrillos camps reached on starting south from Santa Fe. The town site of Bonanza was located in the spring of 1880. Since that time the town has had a steady growth. The water here is of the best quality and plenty of it.

Among the valuable improvements at Bonanza is the Gonzales Reduction Works, owned and operated by an organization of Santa Fe capitalists. The building is 30 by 54 feet and two stories high, with an additional building 24 feet square for the engine and boiler. The purpose of these works is to treat the ores of the camp by concentration, the machinery used being the Bradford patent.

The company have put in a fifty-horse power engine, with three jigs and a slime table or "buddle." The latter is for treating the dust or powdered ore. This gives them a capacity of from thirty to forty tons per day of twenty-four hours.

These reduction works were started up in the latter part of the month of April of the present year, and their success has more than equalled the expectations of the promoters of the enterprise. By this process ore that would not pay to smelt is concentrated at a trifling expense per ton to three times its original value, after which it can be smelted, leaving a large surplus for the mine owners, and at the same time paying the reduction works well.

One and one-half miles south of Bonanza is the noted "Marshall Bonanza" mine, owned by the consolidated Bonanzas Mining, Milling and Smelting Company, also a Santa Fe enterprise. They have a continuous vein of 4,500 feet in length and from four to five in width. The company have developed the property by going down until they came to water at a depth of 167 feet. Levels have been run just above the water line, from the main shaft 200 feet, and the south about the same distance. The company have also sunk an air shaft 500 feet north of the main shaft, the depth of which is 142 feet. Upon this shaft they have erected a "whim," and are running a level south to meet the one coming from the main shaft. By this means a fine current of air will be furnished to the mine and to all the levels. This ore is principally galena, and while it cannot be classed as high grade ore, the quantity in sight and the width of the vein, (from 2½ to 5 feet) will assuredly make up in quantity what it lacks in quality. The building over the mine is 30 feet wide by 70 long.

The engine is a twenty-five horse power, which is used to draw up the ore.

Just above this mine and close up to the foot-hills is the Aztec. There have been four shafts sunk there, one of them to a depth of 71 feet, besides a tunnel 42 feet long, and numerous cross trenches, showing the direction of the lode. The quality of the ore is fine, being composed mainly of chlorides carrying silver and gold. The proprietors are now working a tunnel diagonally inclined to cut the lode which the main shaft is on.

CABONATEVILLE.

About five miles south of Bonanza City, in about the centre of the Los Cerrillos district, is located the mining town of Carbonateville. This camp was once the scene of extensive mining operations by the Spaniards, as is evidenced by the old Mina del Tiro (Mine of the Shaft) and the immense dumps about the Turquoise mountain. Of late the many veins which are found all through the mountains about this town have been opened up in several places and the amount of mineral discovered appears to be inexhaustible. The town of Carbonateville is now a flourishing village, and when reduction works are put up in its vicinity, the camp will be the scene of great activity. Considerable capital has been invested here and the results thus far attained have been very satisfactory.

Among the mines which have been pushed during the last six months and which have particularly bright futures before them is the Bonanza No. 3, owned by the Tennessee and Cerrillos company, now near the head of the list, or among the very first of the valuable mining properties of the district. The mine is the deepest one in the district, being down two hundred and sixty feet, and the ore is very fine. The company has pressed work as fast as money could make it go, and has the satisfaction of securing a true fissure vein of galena with walls as well defined as possible.

The Chester mine is just now causing the greatest excitement. It is down only fifteen feet, the work on it having been recently commenced. A large body of ore which appears to be black decomposed quartz was struck. The ore has been repeatedly assayed and runs high in silver, some assays being secured as high as three thousand dollars. One specimen brought into Santa Fe assayed $550. Experts state the ore will run high all the way through.

The owners of the Cash Entry mine are sinking three shafts, two on the main vein and one on the other. Machinery will be put in at once and operations commenced on a larger scale.

The Great Western mine is down two hundred and fourteen feet. It has a very large body of ore which runs remarkably well. The property is held at a good figure and will be one of the best supporters of reduction works in the district.

The Pretty Betsey mine is receiving machinery and the ore is looking well. The owner intends putting in machinery, an engine and a steam drill. When he has completed these improvements he will proceed with the further development of the mine with all possible speed.

The Sinduda tunnel is being driven rapidly. As yet, however, no ore has been struck, but the owners are not discouraged and work on their property proceeds steadily.

The Good Hope mine is down seventy feet. It has been sold to an English company.

The New England tunnel, situated about 2,000 feet south of the Bottom Dollar, is 3,000 feet long by 1,500. It was located for the purpose of prospecting for blind leads, and some of the finest veins in the district can be traced through it, prominent among which is the famous old Spanish Ruelana, working two shafts 150 feet deep. The tunnel also cuts the veins of the Great Western, Annie Laurie and Chicago, at a depth ranging from 100 to 600 feet below the surface.

No work has yet been done on the Mina del Tiro, which is claimed to be one of the most valuable properties in the camp, on account of some dispute about the ownership, but when this is settled the old shaft, already down over two hundred feet, will be cleaned out and machinery put in.

The scarcity of water in the immediate vicinity of Carbonateville has operated much against the success of the camp, it having to be hauled from Bonanza City. In several places wells have been sunk to a depth of one hundred and fifty feet without meeting any water, but the fact of its presence in conveniently large quantities in the shaft of the Mina del Tiro, leads many to believe that it will yet be struck by going down a hundred or so feet more.

TURQUOISE.—(Historical.)

In the center of this district rises the dome of Mt. Chalchuitl (whose name the Mexicans gave to the turquoise, its much valued mineral), the summit of which is 7,000 feet above tide, and is therefore almost exactly on a level with the plaza of Santa Fe, across the valley of the river of that name to the northeast. In the other direction this mountain has its drainage into the valley of the Galisteo, which forms the southern boundary of the Cerrillos district. The age of eruption of these volcanic

rocks is probably tertiary. The rocks which form Mt. Chalchuitl are at once distinguished from those of the surrounding and associated ranges of the Cerrillos, by their white color and decomposed appearance, closely resembling tuff and kaolin, and living evidence to the observer familiar with such phenomena of extensive and profound alteration; due probably to the escape through them at this point of heated vapor or water, and perhaps of other vapors or gasses, by the action of which the original crystaline structure of the mass has been completely decomposed or metamorphosed, with the production of new chemical compounds. Among these the turquoise is the most important. In this yellowish-white and kaolin-like tufaceous rock the turquoise is found in thin veinlets or little balls of concentrations called "nuggets," covered with a crust of nearly white tuff, which within consists generally as seen on a cross fracture, of the less valued varieties of this gem, but occasionally afford fine sky-blue stones of higher value for ornamental purposes. Blue-green stains are seen in every direction among the decomposed rocks, but the turquoise in masses of any commercial value is extremely rare, and many tons of the rock may be broken without finding a single stone that a jeweler, or virtuoso would value as a gem.

The observer is deeply impressed on inspecting this locality with the enormous amount of labor which in ancient times has been expended here. The waste of debris excavated in the former workings cover an area of at least twenty acres. On the slopes and sides of the great piles of rubbish are growing large cedars and pines, the age of which—judging from their size and slowness of growth in this very dry region—must be reckoned by centuries. It is well known that in 1680 a large section of the mountain suddenly fell in from the undermining of the mass by the Indian miners, killing a considerable number, and that this accident was the immediate cause of the uprising of the Pueblos and the expulsion of the Spaniards two centuries since.

The irregular openings in the mountain, "wonder caves," and the "mystery," are the work of the old miners. It was this sharp slope of the mountain which fell. In these chambers, which have some extent of ramifications, were found abundantly the fragments of their ancient pottery, with a few entire vessels, some of them of curious workmanship, ornamented in the style of color so familiar in the Mexican pottery. Associated with these were numerous stone hammers, some to be held in the hand and others swung as sledges, fashioned with wedge-shaped edges and a groove for a handle. A hammer weighing over twenty pounds was found to which the wyth was still attached, with its oak

handle—the same scrub oak which is found growing abudantly on the hillsides—now quite well preserved after at least two centuries of entombment in this perfectly dry rock.

The stone used for these hammers is the hard and tough hornblende andesite, or propylite, which forms the Cerro d'Oro and other Cerrillos hills. With these rude tools and without iron or steel, using fire in place of explosives, these patient old workers managed to break down and remove the incredible masses of these tufaceous rocks which form the mounds already described.

RIO GRANDE BRIDGE AT ALBUQUERQUE.—(1,600 feet long.)

That considerable quantities of the turquoise were obtained can hardly be questioned. We know that the ancient Mexicans attached great value to this ornamental stone, as the Indians do to this day.

The familiar tale of the gift of the large and costly turquoise by Montezuma to Cortez for the Spanish crown, as narrated by Clavigero in his history of Mexico, is evidence of its high estimation.

It is not known that any other locality in America has furnished turquoise in any considerable quantity. The origin of the Los Cerrillos turquoise, in view of late observations, is not doubtful. Chemically it is a hydrous aluminum phosphate. Its

blue color is due to a variable quantity of copper oxide derived from associated rocks. It is found that the Cerrillos turquoise contains 3.81 per cent. of this metal. Neglecting this constituent, the formula for turquoise requires: phosphoric acid 32.26, alumina 47.0, water 20.5—equals 100.

Evidently the decomposition of the feldspar of the trachyte furnishes the alumina, while the apatite, or phosphate of lime, which the miscroscope detects in this section of the Cerrillos rock, furnished the phosphoric acid. A little copper ore is diffused as a constituent of the veins of this region and hence the color which that metal imparts.

HUNGRY GULCH.

Hungry Gulch, one of the principal mining camps of the Cerrillos district, is situated about three miles west of Carbonateville and near the abandoned pueblo of San Marcos. Work is being steadily prosecuted on all the claims located—which include about every part of the available mineral land in that section. Work is plentiful, the demand for miners largely exceeding the supply; and experienced men can command high wages. The ore found here is high grade, running considerably above the average, and there are now many tons of it on the various dumps awaiting reduction works. The miners of the camp are very anxious to secure the erection of a smelter at some point in the gulch, claiming that it is one of the most desirable points in the Cerrillos district to place one, being central in its location, water and wood being found in abundance, and there being already enough ore on the dumps to keep a smelter worked to its utmost capacity. With proper facilities for reducing its ores, Hungry Gulch would rank among the best camps in New Mexico.

SAN PEDRO.

San Pedro is situated very similarly to Santa Fe, in a basin between the mountains. The surroundings, however, are different from those around the latter city, as the mountains here are covered with a heavy growth of timber.

The San Pedro and Cañon del Agua company have their smelting and stamping works, offices, etc., here. The grant which is owned by that company comprises a territory six miles wide by ten miles long. The original grant was made by Mexico, in the year 1839, to Jesus Miera and others.

The amount of money expended here in the purchase of land and the improvement is claimed to have been over $1,000,000.

The company owns a saw-mill which has already sawn over 500,000 feet of lumber besides material enough for 30,000 first-class shingles.

It will be seen from the above that the business here is quite extensive. An artesian well has been bored a quarter of a mile below the town site, to a depth of four hundred feet. There are three hundred feet of water now in it and it will very probably supply all the water needed at the smelter and camp. Another well is being bored two miles south of camp.

The building for the smelter and stamp machines is one hundred and thirty-five feet long by seventy-five feet wide; three stories high. The smoke-stack is ninety feet high and two and a half feet in diameter, made of the very best quality of iron.

The stamp mill contains twenty-five stamps, and it is the intention of the company to increase the capacity to one hundred in a short time.

One of the greatest works yet consumated in the Territory is the putting in of the large main from the Sandia mountains. This work is now finished and cost the enormous sum of $500,000. The total amount expended on building the water works and the houses for the use of the camp has reached the sum of $700,000, and much yet remains to be done. The object of bringing the water from the Sandia mountains is for the purpose of working the rich placer mines by means of hydraulic power. The extent of country to be worked by this means is great, and very rich in gold. The land is now being surveyed and cleared off for this purpose. A large number of men are kept constantly employed in this work alone. The earth in most places is deep, and the gold is found from the grass roots to bed rock.

THE BIG COPPER MINE.

One of the most celebrated properties claimed by the company, and which alone will furnish ore for several stamp mills, is the old copper mine, worked centuries ago by the first Spanish settlers in New Mexico.

Proceeding up the mountain, the first indication of work noticed on the gold and copper mine, is a tunnel which is nearly completed, running on a level into the mountain three hundred feet to meet the main shaft. This tunnel will eventually be the main outlet to the mine. This tunnel is eight feet high by seven feet wide, and well timbered on the sides and overhead with timbers ten inches square. Again proceeding upward in a few moments the mouth of the mine is reached, where thousands upon thousands of tons of ore are piled up ready to be taken to the stamp mill and smelter.

GOLDEN.

Better kown as the New Placers, adjoins the Cañon del Agua grant. The placers here are known to be rich, but they are not developed, owing to a scarcity of water. A successful dry washer is what this district needs, and if the problem is ever solved, claims here will at once take a jump in prices. As it is, they can be bought, in many instances, for much below their actual value.

There are also located in the New Placers district, and in the immediate vicinity of Golden, a number of leads, the ore from which assays well in gold, besides containing a large amount of copper, among which is the well know Delgado mine. Free gold is visible all through the ore from this mine, and only a lack of capital has prevented its development to a great extent. The "Era Southwestern" is one of the best developed and promising properties of the district. In a drift of sixty feet commencing at the bottom of a hundred-foot shaft, a gain of six feet was made in the width of pay streak. The latter is nine feet in width at this writing and situated between well defined walls. The mineral is an iron oxide and sulphide, is immense in quantity and assays $43.50 in gold.

Among the other mines and prospects in the district are the Evening Star, with a 21 foot shaft, ore, galena and copper; the Gladiator, with a 50 foot shaft and tunnel; the Queen of the West, shaft down 30 feet, ore, galena; the Emerald, shaft down 113 feet, and two tunnels, each in 50 feet, gold and copper ore; the Lehigh tunnel in 88 feet, gold and silver ore, and the Pine Tree, shaft down 50 feet, with cross-cuts, 25 feet. On the dumps of each of these mines there are considerable quantities of ore awaiting reduction. There are too small stamps at Golden, but at present they are doing nothing.

The Town of Golden contains about 300 inhabitants, and supports a weekly newspaper, the "Retort," published by Col. R. W. Webb, one of the pioneer journalists of the Territory.

THE MOUNTAINS AROUND SANTA FE.

These mountains have never yet been thoroughly prospected, and there are as yet no developments to be found. Indications of mineral, however, are plentiful, and it is far from improbable that it may be discovered in paying quantities of superior quality. Iron, coal, marble and free clay is present in quantity, but undeveloped.

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SOCORRO COUNTY.

(*Reported by Commissioners Fisher and Abeytia.*)

It is principally to our vast mineral resources that we depend on and look forward to with a confidence that comes from the meagre developments already made, and that, too, in the face of many difficulties. It is an established fact that the county of Socorro embraces not only the greatest extent of mining lands in the Territory, but also some of the very best. Her silver and copper ores are remarkably rich, assaying often into the hundreds, and many times into the thousands of ounces to the ton. Well defined leads of copper have been located which assay from 40 to 70 per cent. of the metal. When we take into consideration the fact that the copper ores of Lake Superior give but five to seven per cent. of the metal, and are worked profitably, can any one doubt that the mines of Socorro county will prove a source of immense wealth?

The most noted silver leads so far discovered assay from 60 to 300 ounces to the ton, and as the ore is easily treated, leaves an immense profit to the mine owner. As an evidence that practical mining men are satisfied as to our resources, it is only necessary to state that a stamp mill and smelter have been erected at Socorro, and a smelter is now in active operation in the Magdalenas. Others will be built in the Black Range and Mogollons. Silver exists in almost every variety of rock found in the county. The best ore, of course, is found in regular, well defined leads. These leads seam all the mountain ranges in the county. The Socorro mountains, Black Range, Magdalena, Mogollon, Gallinas, San Felicite, Pueblo, Bear Mountain, Oscura, Water Cañon and other districts, are developing wonderfully. The Limitar, Ladrone and Mogollon districts are not only rich in silver but also in copper.

GOLD

is found in different localities, notably in the Mogollon and Black Range districts. The celebrated Ivanhoe mine, is in this county, as is the Torrence, for which $500,000 has been refused. There are scores of mines that have been sold to practical mining men at prices from $10,000 to $75,000 each. The transactions in mines have been carried on in a quiet manner, not with that "boom" which indicates a camp that is but for the day. Mining experts all unite in saying that the time is not far distant when Socorro county will lead in the production of silver and copper and other metals. All that is needed is the judicious investment of capital to bring this about.

COAL.

We have in abundance, and located at points easily accessible, thus solving the question of cheap fuel. A railroad eight miles long has been built to connect the A., T. & S. F. R. R. with the coal beds.

IRON

Of the best quality is found scattered over large districts, and in connection with cheap fuel will be a profitable investment for the capitalist. Manganese and antimony are also met with in large quantities.

Of zinc ore we have an abundance, notably in the Magdalenas. Immense deposits of lead have been opened, but are not worked to any extent. With low freights the mining of this metal will become one of our leading industries.

Sulphur, which enters so largely into the arts and sciences, is found here in almost unlimited quantities, and nearly pure.

Aluminum, the base of all the clays, is one of the leading metals of the county.

Porcelain and fire-clay abounds to a plentiful extent.

A very superior quality of hard marble has been discovered, and covers a large extent of territory.

Mica, graphite, chalk, salt, and in fact nearly all the known metals, are met with here, almost all of which would pay a handsome margin on the money invested in their development.

Although this portion of Uncle Sam's dominion was the first colonized by Europeans, yet its mines are the least known. But within the past year and a half a wonderful change has been wrought. Hardy prospectors have come in by the score, followed by the capitalist, who, seeing our wonderful resources, have not hesitated to invest.

(To illustrate the activity that has lately been manifested, it is only necessary to state that nearly 3,000 locations of valuable mining properties have been recorded within the past six months.) Most of these locations have been made by prospectors not very well provided with this world's goods, thus enabling capitalists to purchase good property at a mere fraction of its true value.

OLD AND NEW METHODS.

The early Spaniards were evidently acquainted with the great mineral wealth of this portion of New Mexico, as the remains of their work will amply attest. When it is known that they shipped into Spain and Mexico millions of dollars, and that

their work was done in the rudest manner, what can we expect will be the result under the improved methods in mining that we find two centuries later? These early miners knew nothing of the powerful explosives; they transported their ores on the backs of mules and men hundreds of miles to be smelted in the most primitive manner, yet wealth flowed into the lap of Spain in such profusion as to astonish all christendom. At present one miner can do as much work in a day as a score could have done two centuries ago in the same time, and of course the results will be as great proportionately.

It is an evident fact that, however rich a mine may be, it needs capital to develop it. Money is required to get the mine into a shape for its economical working and the purchase of machinery before it can be made productive. The investor, knowing this fact, naturally looks about him, for a point where with the least expense he can achieve the greatest results. We are confident that Socorro county offers this advantage.

Our gold, silver and copper mines are not the only inducements we hold out to skill and capital. The manufacturer can here find an opening for almost any line of business in which he may desire to engage. He can utilize our iron, lead and zinc, with which the country abounds. Our clays offer great inducements to the manufacture of pottery.

Woolen mills could be operated successfully, as native labor is not expensive and wool is cheap and can be procured in unlimited quantities.

Machine shops and foundries are needed to keep pace with the growth of our mines.

Our fine marble can be quarried and shipped to advantage. The great sulphur beds might be utilized. We should not only supply the great southwest with salt and alum, but also ship it to distant points. In fact there is hardly any legitimate enterprise, backed with sufficient capital and brains, that cannot be made to thrive in Socorro county.

MOGOLLON DISTRICT.

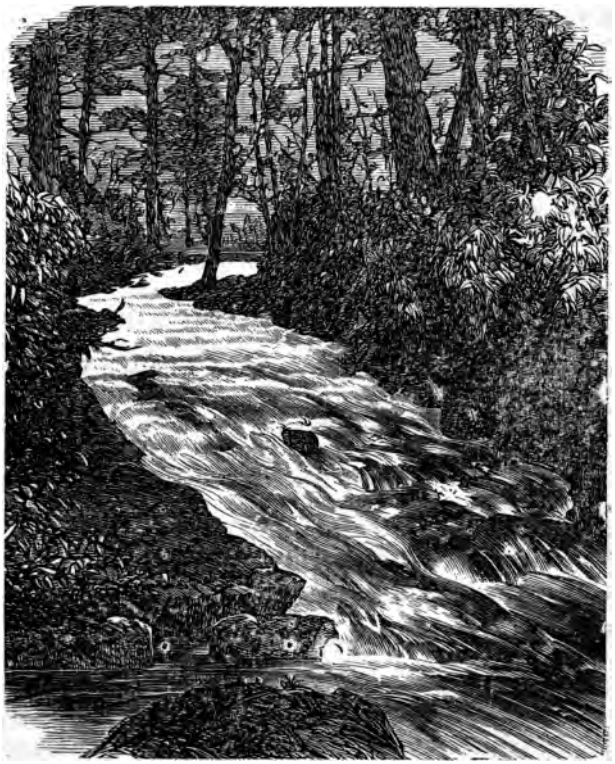
(*From Burchard's Production of the Precious Metals, 1881.*)

This is a very extensive mineral bearing section in the southwestern portion of Socorro, and extending into Grant county. It is located in the Mogollon and Tulerosa mountains, and has already been several times alluded to as a region of unusual promise. Its remoteness from the ordinary routes of travel, the rough and difficult character of the country, its sparse population, and the danger attending the work, have hitherto pre-

vented the district from being as thoroughly prospected as other more favored sections. Sufficient has, however, been learned about it to lead to the general impression that it will probably become a great producer of the precious metals.

This county is especially noted for the extent of its mineral area, and the number of discoveries already made within its limits, but it is impracticable in a report of this kind, to give to each the attention it may merit. Further comment upon its resources will, therefore, be reserved for a future occasion, when development shall have become more general.

The following letter by Col. D. J. M. A. Jewett, of Lincoln county, a civil engineer and mining expert of excellent reputation, descriptive of the Mogollon district, is so complete, that nothing more remains to be said of it. It is submitted as taken from the New York Mining Record of January 28, 1882.



IN THE MOGOLLONS.

"The eastern and northern part of this range, and the country adjacent, are covered with the finest body of timber in this part of the world, and is the only one which will probably exceed local demands.

This mountain mass (locally divided into the Tulerosa, Diablos and Mogollons) is the source of the headwaters of the Gila and San Francisco Rivers. The tributaries cut the range into steep and narrow ridges, running nearly east and west. The cañons of the streams are deep, narrow and gloomy, but, considering their small size, grand beyond expression. The mining camps are mostly confined to the cañons of six small tributaries of the San Francisco named (proceeding from south to north) Dry Creek, White Water, Silver Creek, Mineral Creek, Copper Creek and Deep Creek. Upon all these are croppings of valuable mineral. In all is a supply of wood and timber, sufficient for present needs.

All those named are handsome trout streams, and of never failing abundance. The elevations are a couple of thousand feet lower than the valuable camps of Lincoln county, and not much higher than those of the Magdalena and Socorro ranges.

These camps, though old (among the new camps of New Mexico), have been held in the background by their distance from any great route of travel. They are even now 130 miles from a railway. The two old routes to Arizona pass, one far north, and thousands have passed by to prospect in localities far less favored.

The range, moreover, has been the scene of many an Indian depredation, and of many a scare. Its streams and groves were favorite resorts of the Apache, and he bitterly resented (as well he might) any intrusion upon his fairest domain. The pioneers of the camps, literally took their lives in their hands, and many a one found a grave here instead of wealth.

In times quite recent, only the boldest suggested a prospecting tour in the Mogollons. Less than two years since, the entire population as far north as Copper Creek, were driven out by Victoria. In August last, Nana and his band skirted the range to the east on their northern raid, and on their return. Probably the Apache has been seen in the neighborhood for the last time, but the pioneers have not lost the habit of watching for his 'sign' nor of dreading (as the gravest must) his stealthy attack.

A solitary grave, at the mouth of Mineral Creek cañon, is the monument of the last Indian raid. In it lies James Cooney, of New Orleans, the discoverer of the great Silver Bar lead on the creek named. This lead has mainly given celebrity to the

camps, not because the richest or most extensive, but because the best developed. Its ores are not only rich but strikingly beautiful, and its discoverer and his brother, the present owners, are better known than other explorers.

On Hopper Creek, nestled in the very heart of the mountians, lies the little town of Clairmont, now of, say 400 people.

Here is a saw-mill erected by Daniel Kelly, at a cost of something like $14,000. The owner waits for a market, which is certain to come after a time. A good many of the old timers have brought in their families. Three old log forts crown the little swells in the outskirts of the town, and speak eloquently of the perils amid which the little town has grown up.

In the San Francisco Valley, two miles from the mouth of Mineral Creek cañon, lies the little town of Alma. Here is a large general store (J. G. Barney), the only one, so far, in the camps. Considerable building is in progress here, and at Alma will necessarily be the mills for the reduction of Mineral Creek ores.

I have traced in these mountains nine great leads, the least valuable, the Great Western. This does not yet appear of sufficient value to pay. The most valuable in the present stage of development is the Silver Bar. On this are four locations: the Silver Bar, better known as the Cooney mine, and Nos. 2, 3 and 4. The country rock throughout the range are softer than the leads, and their more rapid denudation has piled the gulches with great masses of float, or left the great veins standing above the surface like gigantic walls. Upon the Silver Bar lead are four of these enormous croppings. The least is 12 feet high. The chief is upon the south end of the original discovery. This, by actual measurement, is 152 feet long, from 13 to 15 feet wide, and 35½ feet high. This is not cap rock, but good milling ore. Just south of this the lead disappears under a porphyritict cap, which covers the entire mountain from hence south to a depth of about 70 feet. The course of this lead is southeast and northwest, through the original discovery; from thence it turns abruptly and follows a course nearly due west. Its ores are red and black oxides of copper, bornite, gray copper, chalco-pyrites, green oxide, and azurite to bewildering combinations Many great blocks of this ore are as beautiful as a peacock's tail. Silver is present in combination with copper. In several portions of the vein it appears independently as ruby silver. Gold is present also in considerable quantities, and free.

Some 500 feet of work has been done on this property. The slopes are so sharp and the croppings so large that this small amount of work shows up a large ore body. My measure-

ments and valuations carry the values up in the millions. The exact figures are no longer my property.

The three extensions of this property have, properly speaking, no development whatever. The vein, which is 15 feet wide at the southerly end of the original discovery, is 7 feet wide, where it enters No. 2, and 3½ feet where it last crops on No. 4. These are valuable properties, probably, though not entitled to comparison with the Cooney mine.

Among other prospects on mineral Creek, I examined the Ocean Wave, Silver Twig, Lady Godiva, etc. These are promising prospects, but not yet developed. Indian disturbances have retarded development, and the prospectors have not yet learned that while developed mines bring full value, prospects bring but little, and are of very uncertain sale at best.

On Silver Creek I examined the Evening Star, Carrie Steel, Harker's, Bushwacker, Blue Bird, Red Bird, Buckhorn and Los Angelos.

The Blue Bird is a superb prospect. The lead from two to three and a half feet wide, crops for 800 feet, and has been well prospected. The development is small. The croppings and the fourteen-foot shaft disclose superb ores having black and green oxides of copper, azurite, and bornite as a base, some ruby silver, and free wire gold. The last appears alone usually in white quartz seams; but also sometimes strung in with the copper and silver is a gangue, say half quartz and half heavy spar. While the value of the property is as yet indeterminate, I know of none which promises a better profit upon a thorough and systematic development to a depth of, say, 450 feet. In this case I think this depth sufficient. Water level will be passed at not more than 350 feet. The other prospects named have promise, but nothing more yet Their ores share in the characteristics of the Blue Bird to a greater or less extent.

Upon Copper Creek I examined, among others, the Teneriffe and Cotapaxie claims. These are upon one lead, itself about three feet wide, where it crosses the creek upon the line dividing the properties. The gangue is quartz stained with red oxide of iron. It carries some spar, and alone among the leads of this range (so far as observed by me) has no trace of copper. It carries gold in a free state to an average, according to my tests, of $233 per ton. The development is small, but has been sufficient, as I understand, to cause the sale of the property to western parties at a fair price.

The shaft of the Cotapaxie (five and a half feet wide) was run down upon the wall, the most beautiful wall which I have yet seen in New Mexico. What I mean will be appreciated

when I say that it is perfectly seamless, and solid to the very surface. The hanging wall is not in sight, and it is apparently eighteen inches east of the shaft, so that the width of the vein probably increases going north. A very fine property, which will richly repay investment.

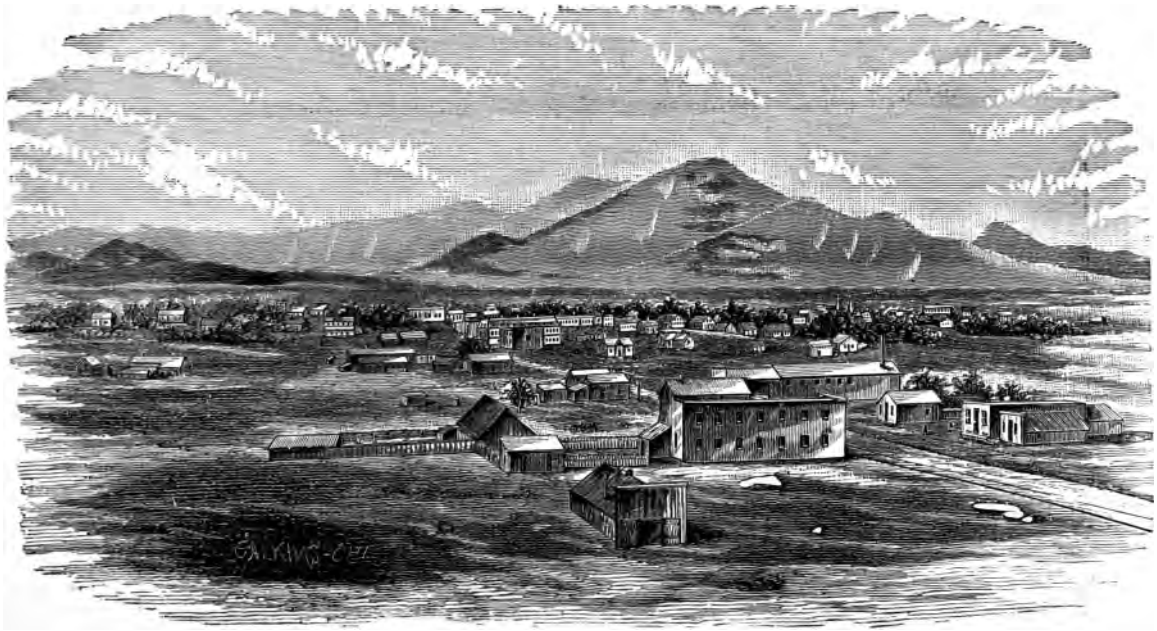
I also examined the Albatross mine, so called. This property has been injured by being hitherto misrepresented. Presented as a mine, it is only a prospect, and a badly developed one, so far. A tunnel 200 or more feet has been run; is on the right of the lead; and has borne steadily away from it. The ore in sight in a prospect tunnel upon the lead is a very hard black oxide, carrying 47.3 per cent. copper and 54 ounces silver. A white quartz lead lying alongside the copper streak crops for several hundred feet over the hill. A few thousands intelligently spent would develop a splendid property.

South of the Teneriffe lies the Snowdrift. Three hundred feet of tunnel and cross-cut have shown upon this property a lead of decomposed quartz and clay, with red oxide of iron in enormous quantities. It is forty feet wide; can be picked out as easily as ordinary clay; is near fuel, water, and an excellent mill-site; carries about $9.50 per ton, and can be worked to considerable profit situated as it is.

I could not find that development upon the other creeks had progressed far enough to render an examination and report necessary or beneficial. Work is progressing, and in the spring I hope to have a better report to present of a second visit.

The camps are very promising. They need hard, earnest work, under intelligent direction. This they are likely to obtain. Investments are, I understand, in progress; mills will be erected and developments go on in the interest of Illionois and eastern capitalists. These will encourage the miners to push on their work and to develop their properties for sale. It is undeniable that the residents might have done more, and that it would have been for their interest to do more. But they are entitled to some excuses. They have had many discouragements. They have seen a great mine stand idle in their midst, and for years unsalable on account of Indian scares and raids, and have had no immediate prospects of return for investments, which they could ill afford, and very hard labor."

Socorro is eminently a mineral producing county, though her agricultural resources are considerable and largely diversified. It is upon the mines that her future prosperity largely depends, and as the value of these have been amply tested, her coming greatness is assured. All that is wanted is to turn the tide of capital and skilled labor to these gold, silver and copper-



SOCORRO, AND SOCORRO MOUNTAIN.

ribbed mountains and hills to cause her to leap into an era of prosperity that will even exceed the expectations of the most sanguine.

TAOS COUNTY.

(*Commissioner Camp.*)

There is little or no doubt that it is from its mines that the future prosperity of Taos county will be largely insured. There has been considerable work done within the last year and new mines are being discovered daily. They bear a very small proportion indeed to what we confidently look for in the near future. The formation of the county, the large quantity of rich float found everywhere, and also the amount of placer deposits, indicate a bright future. Taking into consideration that the mountains have never been thoroughly prospected, and that until recently prospecting has been confined to the foothills, everything predicts success to the intelligent miner. Among the mines which are at this date (1881), being rapidly developed, may be mentioned those in the districts of the Picuris, Arroyo Hondo and Rio Hondo. They variously abound in gold and silver bearing ores, those of the Picuris being very rich in copper and gold. New developments extending more into the mountains are continually being made, and are showing well; while on the Rio Hondo there are very extensive placers which are being worked by a Santa Fe company with hydraulic works and sluices.

Another company has lately commenced operations on the Rio Colorado.

VALENCIA COUNTY.

(*By Gilbert Scudder, Secretary of the Bureau of Immigration.*)

At the present time but little is known outside the Territory of the resources and advantages of this, one of the oldest and largest counties of New Mexico. Situated nearly in the center of the Territory, and having the advantage of two trunk railways recently constructed and traversing the county at right angles, it possesses unusual attractions for the farmer, stock raiser and miner. Its mineral resources have as yet received but little attention, but as soon as the prospector and capitalist shall commence their operations in earnest, its future as a mineral and stock raising district will be established. Some mineral claims have been located but no development of any consequence has been done. In the Manzano range there are some prospect holes, mostly dug by the natives, which show

undoubted evidence of containing gold, silver, copper and lead, and in paying quantities. The one thing needed being capital to develop it. Only three districts have been prospected to any extent to-wit: The "Ladrones," "Spiegelberg Springs" and "La Joya."

The Ladrones mountains is undoubtedly one of the largest deposits of low grade ore ever discovered in the Territory, and to be worked profitably it must be on a large scale which requires capital. For a steady and reliable profit this camp is well worthy the attention of capitalists. The ores are principally galena, carrying considerable lead and some copper.

Spiegelberg Springs is a young camp, but gives promise, with development, of being one of the best copper producing districts in the Territory.

The La Joya mining district, east of and near the Rio Grande, is situated in the southern part of the county. The ores are principally galena carrying large deposits of silver and gold which can be easily milled, and the work already done on the leads proves its presence in large and paying quantities.

The Atlantic and Pacific railroad, or thirty-fifth parallel road, runs nearly two hundred miles in a westerly direction and centrally through the county, and connects the Santa Fe railway system in the valley of the Rio Grande with Arizona Territory; thus bringing within easy reach its immense coal fields, pastoral ranges and agricultural valleys. These coal fields are already being worked in places with most satisfactory results, and now that the Indian question has been virtually set at rest, considerable herds of cattle and flocks of sheep are being driven upon the public domain, although but little of the latter has been entered at the land office. This county it will be understood also possesses the advantage of having the entire western half free from land grants, and, as it covers an area of over 9000 square miles, there are very large tracts of government land still open to entry and well adapted to stock raising and homesteads, and upon which coal and mineral prospecting may be engaged with profit.

About twenty miles east of Manzano, are immense salt lakes where large deposits of excellent white salt are found, and which can be had free for the carting. Salt works established for its refinement would prove very profitable and most of the Central and Pacific States and Territories would afford an easy market for its disposal. Let a few enterprising capitalists avail themselves of the opportunities here open and Valencia would soon be as much sought after as are now her luckier and better known sister counties.

AGRICULTURE, HORTICULTURE AND STOCK.

Commissioner of Immigration Kroenig, of Mora county says:

"Messrs. S. B. Watrous & Son, two years ago sowed thirteen and a half pounds of winter wheat and harvested one thousand nine hundred and seventy-five pounds. The oats raised here are of an excellent quality, the yield being forty bushels to the acre in ordinary years. A bushel weighs from forty-two to forty-five pounds. Barley yields well. * * * * *

Immense tracts of the best grazing lands are only pastured when abundant rains fill the numerous natural depressions with water; experiments have proved that in these depressions by sinking wells water can be obtained within a reasonable distance. Wind-mills could be erected at a small cost to furnish an inexhaustible supply of water. In this manner the stock interests could be fully trebled."

Commissioner Camp of Taos, records:

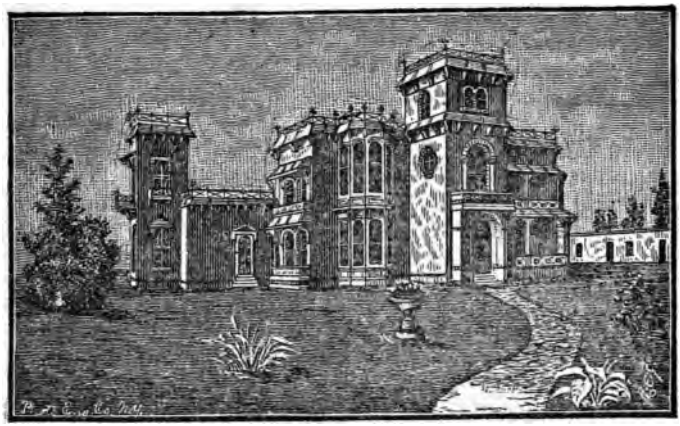
"The wheat raised is of a superior qualty. The berry is exceedingly large and plump; a bushel of the same will average in weight from 65 to 68 pounds, the latter weight being by no means uncommon. The ordinary yield per acre is from fifteen to twenty-five bushels, while, under special care in cultivation and irrigation, a yield of sixty-five bushels has been reached.

It is one of the few sections of the Territory that is adapted to the growing of potatoes. Vegetables of all kinds grow to astonishing size and perfection. * * * *

The amount of land under the plow does not exceed one-seventh of the available area adapted to cultivation. *

While much of the land under ditch is held under grants, it can in many cases be purchased at reasonable figures, carrying with it the right to use the present acequias or ditches."

Commissioner Gusdorf: "The successor of Mr. Camp, writing under recent date, fully confirms the yield of wheat above given, and also reports the yield of potatoes in the mountain parks at sixty bushels to the acre without irrigation.



A MODERN RESIDENCE IN NEW MEXICO.

(Franz Huning, Esq., Albuquerque.)

Commissioner Eldodt of Rio Arriba, reports:

"On the eastern side of this far-famed valley there are thousands of acres of rich land still awaiting enterprise, to place it under a proper state of cultivation. This land is of a more productive nature than any other within the county limits, and the only thing necessary to develop its hidden wealth, is the construction of an irrigating ditch, for the constant and abundant supply of which, the waters of the never-failing Rio Grande are ever at hand. * * * *

Being so well wooded and watered, as well as most abundantly supplied with the most nutritious grasses, renders it a country superior for stock raising."

Commissioner Prichard, of San Miguel, writes:

"The cattle come off the pastures in the spring equally as fat as in the fall. The fact is in marked contrast with other grazing localities. Texas even does not possess such grazing advantages. There the grass dries after frosts and has but little nutriment left, and cattle become extremely thin in the spring season, and are swept off by thousands in consequence of the severe "northers" which sweep down along the plains. "Northers" in this country, are but little felt, perhaps for the reason the force of the winds is broken by the spurs of the Rocky mountains extending along the northeastern border of the Territory. * * * * *

The soil is almost invariably rich, and anything like intelligent farming produces abundant crops of corn, wheat, oats,

barley, buckwheat, rye, etc., and all the hardier class of vegetables. Cabbages, onions, radishes, turnips, etc., grow to great size, and have a peculiar freshness and excellence, much superior to the vegetables of the States. Peas and beans produce enormously, particularly the latter, which is raised as a leading crop by the native population. * * *

The apples grown in this county on the ranch of Don Lorenzo Labadie, at Santa Rosa, took the premium at the Territorial exhibition held at Albuquerque last summer."

Commissioners Fisher and Abeytia of Socorro give assurance that:

"All kinds of temperate and semi-tropical fruits, grains and vegetables are raised abundantly in the valleys, while the plains and mountain ranges will give pasture to countless herds of horses, cattle and sheep. No country on earth will excel the valley of the Rio Grande and its tributaries for the production of the grape, pear, peach and small fruits."

Comissioner Fountain, of Doña Ana, recites that:

"Fertilizers are but seldom used, as each irrigation leaves a slimy deposit on the land, which renews the soil, and is, in fact the best fertilizer that could be used.

With proper cultivation forty bushels of wheat or eighty bushels of corn can be made to the acre. It is not unusual to sow wheat in winter, harvest the crop in June, and then plant the same land in corn, which is harvested in October or November of the same year. * * * *

Apples, peaches, pears, plums, apricots, quinces, and indeed all fruits adapted to a southern temperate climate, grow in profusion and to perfection. Fruit growers are troubled with no diseases of tree or fruit, no damaging insects, or "off years," in fact with none of the ills incident to horticulture in other localities. Grape culture is the great specialty. A vineyard that has reached the age of three years and upwards will produce 16,000 pounds of grapes, equal to 800 gallons of wine, to the acre. From seven hundred to eight hundred vines are set out to the acre.

* * * *

We can say, from actual experiment, that (with careful cultivation) 50,000 pounds of onions can be produced to the acre *as a rule*. These onions far surpass the famed Bermuda onion in every respect; they are larger, better flavored, milder, and better shaped, and would command a much higher price in the eastern markets. They can be marketed on the ground where raised at *three cents per pound*. * * *

Agricultural land of the best quality suitable for fruit and vine raising can be purchased at from five to ten dollars per acre

with good title. An acre of land containing eight hundred bearing vines is worth one thousand dollars.

If properly cultivated and cared for the produce of a single acre should sell each year for:

If grapes	$ 800 00
If fruit, such as apples, peaches, pears, etc.,	500 00
If small fruit, such as strawberries, etc.,	1,000 00
If onions	1,000 00

Commissioner Lawrence, of Grant, relates:

"The soil of the valleys is a rich sandy loam, composed of the disintegrated matter of the older rocks and volcanic ashes. It is light and porous and of surprising fertility. Corn, wheat, oats, and barley, grow well; corn is a staple product.

Cabbages grow splendidly, often weighing from 30 to 50 pounds each. Onions also grow wonderfully large, weighing from one to two pounds each. Beets, radishes, turnips, and carrots grow well everywhere. Beans, peas and tobacco, are also grown successfully. Potatoes are grown upon the upper Miembres. * * * *

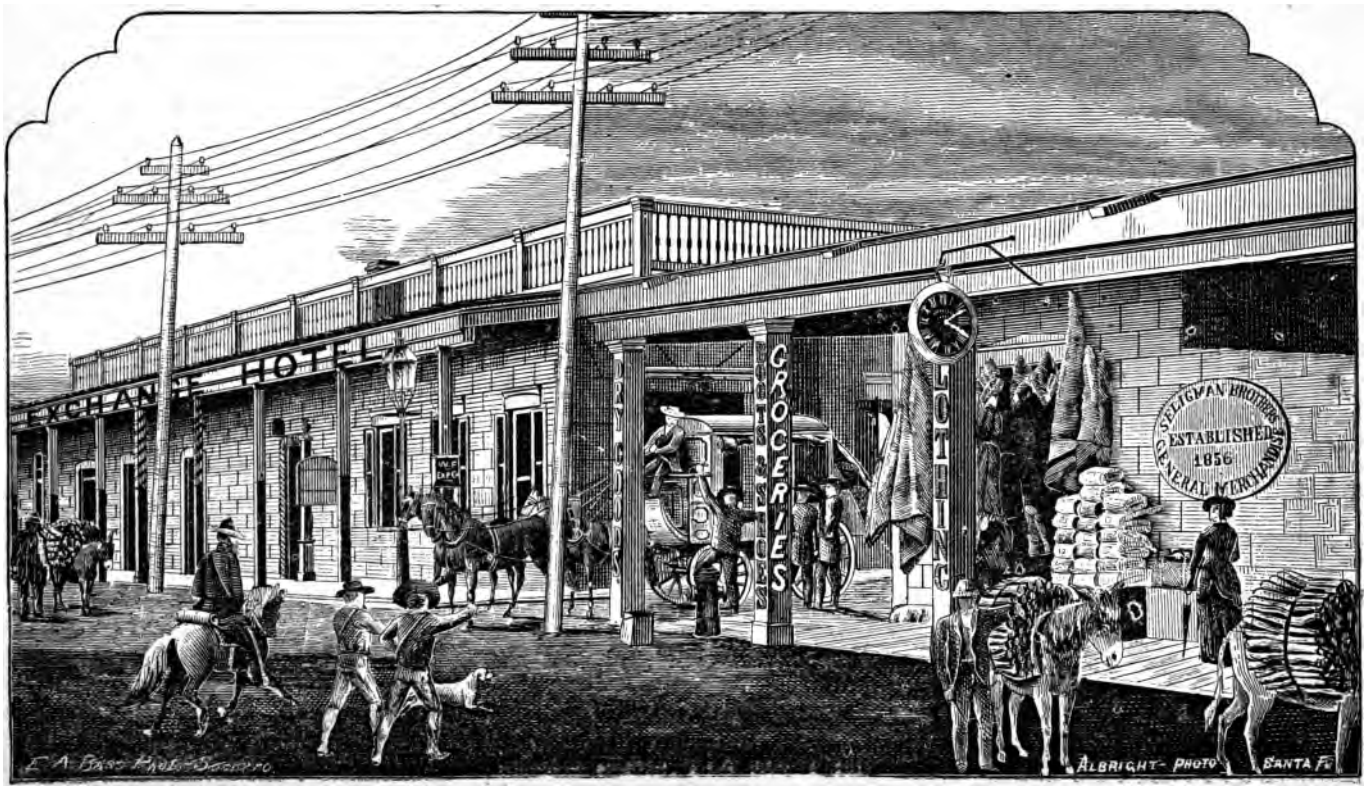
Go where you may you will find no more nutritious grasses than our black and white gramma.

Stock of all kinds graze on this grass during the winter and in the spring are in better flesh than the stock of Missouri that is fed daily."

Extracts from the reports of the commissioners for Bernalillo and Colfax respectively have been made in the body of the main report, to which reference is made. These counties each have a large agricultural area, and in capacity for stock raising are among the very best. The same is true in every particular of Socorro county.

Commissioner Seligman, of Santa Fe, says:

"The agricultural lands under cultivation are the Upper Pecos which courses along the eastern border of the county, along the Rio Santa Fe, running southwesterly from Santa Fe, and for twenty miles along the Rio Grande valley in the northwestern portion of the county. There is likewise a considerable breadth under cultivation along the Rio Nambe, the Tezuque and the Galisteo. The system of cultivation is after the manner of the patriarchs of old, illustrations of which may be found in the current dictionaries of Holy Writ. The cultivation and yield is sufficient, however, to satisfy the most critical that with improved methods and introduction of an economical system of irrigation, that all the grains, vegetables and fruits adapted to Iowa, Nebraska and central Illinois, could be grown with entire success, and in abundance. The altitude of the county, it will be under-



STREET SCENE, OLD SANTA FE.

stood, is from 5,500 to 7,000 feet, hence a comparison with States further north, but of much lower altitude. Vegetable gardening and horticulture, and milk and butter ranches offers specially profitable inducements. Lands under ditch can be bought of resident owners for from $10 to $50 per acre. Santa Fe has an area of over 2,000 square miles. It has a considerable range for cattle and sheep, but is mainly occupied by domestic flocks, and herds. The population of the county is largely engaged in mining and commercial pursuits. Three of the Indian Pueblos are included in the county. The latter are farmers, own small flocks and herds, are industrious and constitute and important producing class. In fruits and vegetables the gardens in and about Santa Fe are among the finest in the Territory and are a standing illustration of the possibilities of agriculture and horticulture in New Mexico under intelligent management. As to variety, flavor and yield Santa Fe gardens will compare favorably with the best.

The Bureau of Immigration has on exhibition, at its office in Santa Fe, a sample of corn in the ear, which will compare favorably with Ohio or Iowa corn in size and yield, which was grown in the Placer mountains, Santa Fe county, without irrigation. The sample is from a field of twelve acres of corn of the same kind.

The following under Stock and Alfalfa, from Commissioner Fountain's very full report, before referred to, is not only applicable to Doña Ana county, but may be accepted as true of the Territory generally.

STOCK.

The vast plans and extensive mountain ranges of Doña Ana county are covered with a species of "gramma," which grows in bunches, more or less thick, according to the locality, but it is always found sufficiently abundant to furnish stock with the most nutritious food at all seasons of the year. It does not flourish on damp or clay soil, and hence it is not found in the river bottoms. It thrives best in sand and gravel and is found in perfection on the dry sandy plains and rocky hill slopes. Horses, cattle and sheep live and thrive upon this excellent grass without other feed; flowerless and seedless, it covers the broad plains and clothes the mountain sides with withered looking bunches that seem to combine the qualities of grain and the best of hay in the greatest perfection.

Cavalry officers, freighters and stock-raisers give it the very first rank among all sorts of hay, and assert that it is superior

as hay, to best clover or timothy, and this opinion is shared by all who have had experience in its use. Thousands of tons of this valuable hay can at any time be had for the cutting and baling in close proximity to a railroad track for over one hundred and fifty miles in this county. Good gramma hay can be cut any day in the year. The best season for cutting, however, is in the months of September, October and November, or at any time after the summer rains are over and before the first frost. With thousands of square miles covered with such grasses, with a climate that permits stock to run at large unsheltered every day in the year, Doña Ana county necessarily counts stock-raising among the most important and most lucrative industries. Scarcity of water on the plains is a drawback, but one that can easily be overcome. The railroad company who have laid over two hundred and fifty miles of track in Doña Ana county have never failed to find water on the plains wherever they have bored or dug for it. Persons intending to take up stock ranches will have the benefit of this experience. Intelligent stock men assert that the profits on cattle and sheep raising will average fifty per cent. annually on the amount invested, and that the average loss will not reach two per cent. *No kind of stock is ever required to be winter-fed or sheltered.*

ALFALFA.

Undoubtedly the most valuable of forage crops adapted to the climate of the Mesilla valley is the alfalfa, a variety of Lucerne. Stock not only eat it with avidity, but thrive and fatten upon it. It attains a height of from twenty-four to thirty inches, and *five cuts of forage*, aggregating to something like eighteen to twenty tons of hay per acre, have freqently been made in a season. It is difficult to overestimate the importance of alfalfa to agriculture in this valley. It is the most available green forage during summer, and as an adjunct to dairy and stock farming is invaluable.

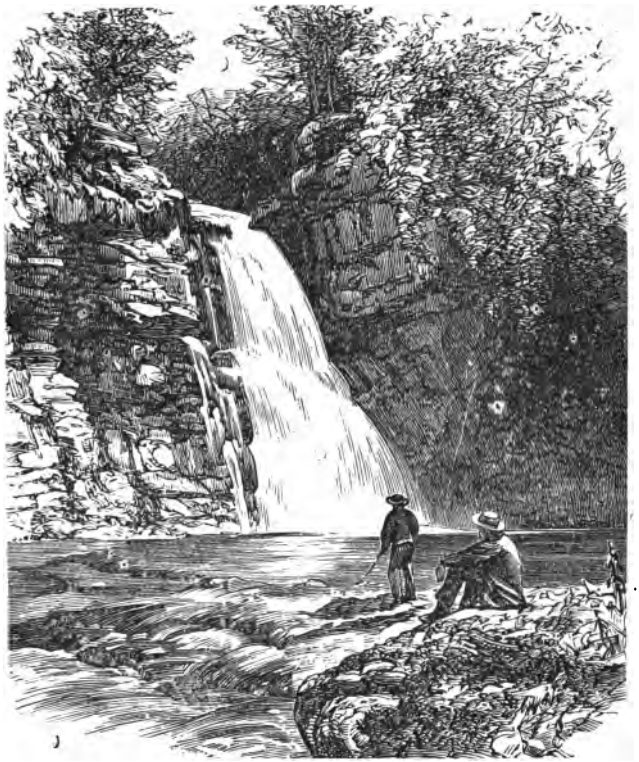
There is no such thing as a dairy farm in Doña Ana county! This is very remarkable when we consider that fresh butter of fair quality can always find a ready market at sixty cents per pound; (eastern butter of a poor quality sells for fifty cents), and forty acres of alfalfa would be sufficient to keep forty good cows. I know of no investment that would, if judiciously managed, prove more remunerative for the amount of capital invested than a small dairy and poultry farm in this valley. Eggs sell at from thirty cents per dozen in the spring and summer to fifty cents in the fall and winter. Fowls cannot often be bought at

less than seventy-five cents. There are no special difficulties to be overcome in dairy farming or poultry raising in the Mesilla valley.

Commissioner Dolan reports:

Stock raising will always be the most prominent and profitable industry of this county.

For stock raising Lincoln county has no superior. The different kinds of nutritious grasses afford an abundant supply for stock during all seasons of the year, so that vast herds of cattle and sheep subsist on range, winter and summer, and keep in such condition that they are fit to market at any season of the year. The stock men have no difficulty in disposing of their marketable cattle, at good prices without being obliged to drive them to market, purchasers taking them from the range where



ON THE RIO BONITO.

they are raised, the demand being always much greater than the supply, to meet the contracts at military posts, Indian agencies, etc., in this Territory and Arizona. The profit from the industry in this county, where cattle and sheep have such fine ranges, is enormous; and it is within reasonable bounds, to say that the average profit from stock raising will exceed thirty-five per cent. on the investment, and there is no immediate prospect of a diminution of that profit by overstocking the market.

Great attention has been paid in the last few years, to the improvement of breeds of stock, so that now nearly all the cattle and sheep raised are graded up from the former native stock of the country.

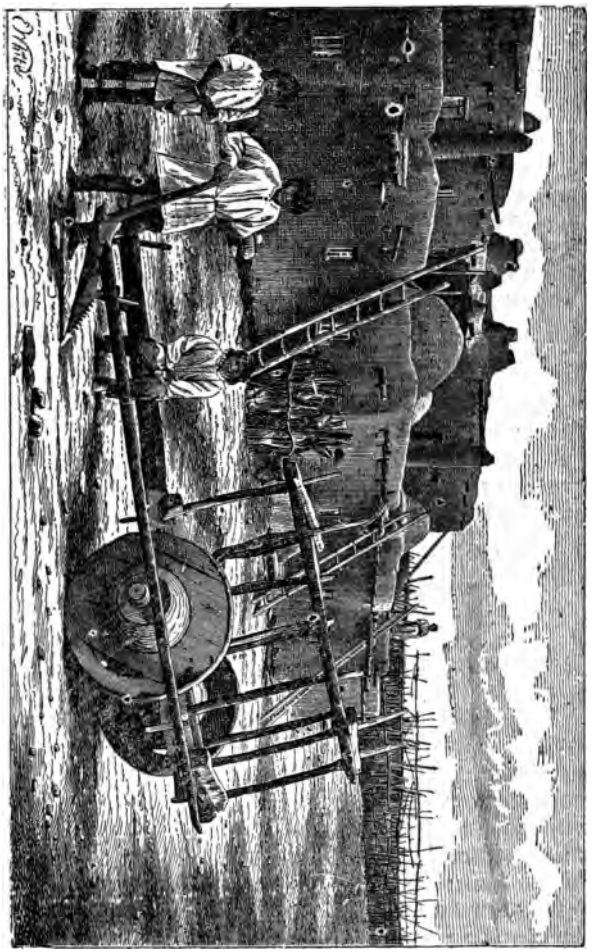
Chas. S. Kusz, of Manzano, in Valencia county, says:

For stock and sheep raising purpose, Valencia county is unsurpassed if equaled by any other county in the Territory, owing to its temperate, healthy climate, unbounded pasturage, consisting of several kinds of nutritious grasses, among which are the gramma, gramma chiva and chamisa. No expense need be incurred for shelter during the winter, which is very short and mild, the timber, hills and valleys furnishing natural wind-breaks and all the protection necessary. The valley of the Rio Grande river which crosses the county from north to south and traversed by the Atchison, Topeka and Santa Fe railroad, is undoubtedly one of the best farming, horticultural and gardening sections in the Territory. Without any fertilizers whatever, onions are raised weighing from one to five pounds, beets from ten to fifteen pounds, cabbage as high as fifty pounds each, wheat with kernel nearly as large as corn, and other vegetables in proportion, being of best quality and flavor and not of a coarse or inferior grade.

Grapes, apples, pears, peaches, plumbs, prunes, almonds and figs have been grown in the Rio Grande valley with succes and their cultivation engaged in as a business would prove successful and profitable in Valencia county.

The county has numerous streams running through it, affording abundance of water; besides there are many springs, and with little difficulty so far as the experiment has been made, water can easily be obtained in abundance on the plains by sinking wells, and vast herds of cattle can be grazed by supplying water from wells, worked by wind-mills, where the streams are too remote from this splendid pasturage, to be now made avail-

able. The valleys along the streams are usually narrow; the RioGrande valley being the widest and affording more agricultural land in a body, than any of the other valleys in the county. Crops have to be raised by means of irrigation, and are more



INDIAN CART AND VILLAGE.

reliable than where the rain fall is depended upon for a successful harvest. Wheat, corn, oats, barley and all kinds of vegetables do remarkably well in this region. Fruit is successfully raised wherever it has been tried.

THE COAL FIELDS OF NEW MEXICO.

(*By Oscar Leor, in Lt. Wheeler's U. S. Geological Survey, 1873.*)

Numerous deposits of coal are found in New Mexico. They belong principally to the cretaceous age; in some exceptional cases, however, to the carboniferous. These coals differ widely in composition and appearance in different localities. They often bear impressions of leaves, particularly the brown coal stratas in northwestern New Mexico.

PLACER MOUNTAIN AND LOS CERRILLOS COAL, SANTA FE COUNTY.

This bed is between slate and limestone on the northern slope of the Placer mountains, thirty miles south of Santa Fe. The coal is compact, massive, not friable, nor intumescing. Color, jet black; luster, brilliant; fracture, conchoidal, uneven; specific gravity, 1.45. The coal is probably of carboniferous age, and ranges among the semi-anthracites. Its composition is as follows:

Water	2.10
Volatile, combustible matter	6.63
Fixed carbon	86.22
Ash	5.05
	100.00

TRUE ANTHRACITE.

From the Rio Santa Fe and Rio Galisteo to the Placer mountains, the country is broken into hills and coñons; in some portions, however, it is nearly level. The principal rocks in the northwestern portion are basalt and sandstone, with hills of gypsum, called in New Mexico, "Hasped" or "Yeso."

The Los Cerrillos mountains are made up of granite, trachyte, and quartzite, and partly, also, of quartzite schist, while the southeastern portion of the region consists of strata of clay, coal, shales, and sandstone, which are well exposed in their succession in the coñons and in the narrow channels, or arroyos.

The thickness of the coal strata varies from one-half foot to five feet, and as traced is one continuous bed through Cañon de los Ojitos, Cañon Chupadra, and Cañon de la Chapina; the croppings extend over an area of fully 20,000 acres. Island-like

hills of primitive and volcanic rocks jut out through the sedimentary beds.

The original horizontal position of the strata has been changed in several instances to an incline.

In the southeastern portion of this region a trachyte dike of considerable dimensions has penetrated the strata of coal and sandstone, and changed the horizontal position to such an extent that they now dip at an angle of 25° west. The stratum of coal at this place is fully five feet thick, and is overlaid by sandstone about 28 feet in height. The coal is hard, dense, of brilliant luster, and resembles anthracite in every respect.

Its specific gravity is 1.43. Indeed, chemical analysis of this coal *shows the same composition as that of anthracite.* Its best application would be for blast-furnaces and smelting purposes generally; and since there has thus far been no anthracite coal found west of the Mississippi river, the bed in question is of particular interest and highly valuable.

Although the statement may be superflous, it may be said that this coal contains no injurious pyrites.

Three specimens were examined—one from a short tunnel in the southwestern portion of the tracts, where the coal was dug or mined forty years ago; another from Cañon de la Chapina, and the third from Cañon de los Ojitos.

Constituents.	No.1.	No.2.	No.3.	No.4.
Water	2.10	2.12	.....	.....
Gas	6.63	7.2	11.74	3.84
Fixed carbon	86.22	4.3	70.52	87.45
Ash	5 05	6.3	16.46	7.37

No. 4, is Prof. W. R. Johnson's analysis of a specimen of Pennsylvania anthracite, for which see Dana's Mineralogy, page 758.

The specific gravity of true anthracite coal varies from 1.32 to 1.7. The amount of carbon varies in Pennsylvania anthracite from 85 to 93, and in the anthracite of France from 80 to 83 per cent; further, the amount of volatile combustible matter (gas) varies in different anthracites from 2 to 8 per cent.

In consideration of these facts we must pronounce the coal in question a *true anthracite coal.*

Dr. J. L. Leconte, who examined specimens of this coal before, came to exactly the same conclusion.

Iron ore of a superior quality is found in immediate proximity to the coal beds.

COMPARATIVE VALUE OF COAL IN THE UNITED STATES.

General orders No. 10. Headquarters of the army, January 28th, 1882, gives values as follows:

ONE CORD AVERAGE OAK WOOD EQUALS.

WOODS.

Yellow pine	1 1-5 cords.
Poplar, white pine and cottonwood	1 3-4 "

ANTHRACITE COALS.

Wales, Great Britain	1466 pounds.
Standard, Somerset Co., Pa	1521 "
Other Pennsylvania	1573 "
Forest Improvement, Richardson Co., Pa	1598 "
Wilkesbarre, Pa	1598 "
Scranton, Pa	1614 "
Lvkin's Valley, Dauphin Co., Pa	1651 "
CERRILLOS coal, New Mexico, (from 15 ft. of surface)	1657 "
Scranton, Pa., Del., Lack. & W. R. W	1687 "
Raven Run, Pa	1818 "
Scranton coals not named, Pa	1841 "
Queen Charlotte, N. S	2626 "

BITUMINOUS COAL.

Bituminous coal, Pa	1624 pounds.
Australian brown coal	1646 "
Monongahela coal, Pa	1653 "
Fawcett & Sons, Pittsburg, Pa	1706 "
CERRILLOS, N. M	1742 "
West Virginia Splint, W. Va	1796 "
West Hartley coal	1993 "
Scotch Splint	1970 "
La Plata, Col	2000 "
Davidson's West Hurtley	1970 "
Indiana Cannel coal, Ind	2046 "
Nanaimo, Chase river, Vancouver's Island	2070 "
Cowpen Cambois, West Hartley	2129 "
Leavenworth, Kansas	2307 "
Wellington mine, Vancouver's Island	2223 "
Canyon coal, Fremont Co., Col	2323 "
Wahsatch Mountain coal	2406 "
Chestnut mine, Wyoming Territory	2466 "
Rock Springs, Rocky Mountains	2491 "
Mt. Diablo, California	2592 "
Coos Bay, Oregon	2626 "
Bellingham Bay, Oregon	2641 "
Eastport, Coos Bay, Oregon	2851 "
Pittsburg, Mt. Diablo, California	2965 "

SEMI-BITUMINOUS COAL.

Philson Iron Coal., Pa	1537 pounds.
Cumberland, Pa	1558 "

LIGNITES.

Seatle brown coal, Oregon	2450 pounds.
Weber, Summit Co., Utah	3168 "
Fort Stevenson, Dakota Territory	3712 "

COAL FROM THE RIO PUERCO OF THE EAST, NEAR NACIMIENTO, BERNALILLO COUNTY.

The strata of brown coal are freely exposed in the perpendicular walls of the mesas, and are accompanied by shales, slate, clay and sandstone. Their thickness varies from six inches to eight feet. In some instances the strata have been partially destroyed, and undoubtedly by fire, as evidenced not only by the accompanying clay being turned into brick, but also by heaps of slag composed of silicates of iron and alumina. This brown coal frequently contains a yellowish resin, which has been subjected to analysis. It is bituminous and of cretaceous age, not coking, very brittle, somewhat laminated; luster, dull:

Water	6.00
Volatile matter	37.49
Fixed carbon	52.28
Ash	4.23
Total	100.00

COAL FROM SILVER CITY, GRANT COUNTY.

This bed is said to be of moderate extent. I did not visit the locality in person, but obtained a specimen of the coal at Silver City. It is compact, massive, very hard, not intumescing; luster, metalic; fracture, chonchoidal, splintery. It belongs to the semi-anthracites. Its composition is as follows:

Water	2.13
Volatile, combustible matter	4.86
Fixed carbon	86.56
Ash	6.45
Total	100.00

COLFAX COUNTY COAL (CLASSED WITH TRINIDAD.)

Following is a reference to the coals of southern Colorado, at Trinidad. Prof. C. D. Wilbur, of Chicago, says:

"We trace the same system to the west and southward to Cimarron, New Mexico; thence to Santa Fe and beyond, where this system of coal deposits has been changed to anthracite by the same forces or causes as have produced the anthracite coal-fields of Pennsylvania."

The distance between the points here spoken of is more than two hundred miles, and adjacent to these coal-fields iron ore in great quantities has been discovered. In the same report Professor Wilbur, further says:

"The coals of this region, which may be referred to as the Trinidad coals, because by that name they are readily known, are much superior to the Colorado coals found in the vicinity of

Cañon City and Denver. They are by far the best that have been discovered in the Rocky mountains. They are equal to the best bituminous coals in Illinois, Ohio and Pennsylvania."

He further says:

"In proof of this statement I will quote from the report of Mr. Ellers before the American Institute of Mining Engineers at Easton, Pennsylvania, October 22, 1873, on coke made from Trinidad coal:"

"'This is the first good coke for smelting purposes ever made from lignite alone in America. It has so far always been found necessary to mix bituminous coal, from the coal measures, tar or similar material, with lignite, in order to produce a coke, which even then was in most cases only an indifferent fuel for the shaft-furnace.

"'The coke here presented will answer for all purposes of lead and copper smelting in shaft-furnaces, and if made in proper coke-ovens it will probably be sufficiently dense to carry the high smelting columns of the iron blast furnace. One pound of Trinidad coal furnishes 4.25 cubic feet of purified gas without the use of an exhauster, and 55 per cent. of the coal remains as coke.

"'The importance of this bed of coal for the metallurgical purposes of the far West cannot be overrated when we know that at present eastern coke costs at Denver twenty-two dollars, and at Salt Lake City thirty dollars per ton. The recent analysis of Dr. J. A. Sewell, State chemist of Illinois, made late in December, 1873, still better confirms our statement as to the extra value of these coals. The analysis were made from the New Mexico and Trinidad coals with the same results."

LABORATORY UNIVERSITY OF ILLINOIS, Dec. 16, 1873.

Results of analysis of coals sent me by Professor C. D. Wilbur from New Mexico December 4, 1873.

Specific gravity	1,2215
Water	5.80
Ash	4.17
Total incombustible matter	9.97
Volatile matter	36.81
Fixed carbon	53.22
Total combustible matter	90,03

Coke firm and persistent; ash light, resembling the ash of wood. It contains a trace of silver. The coal bears only a slight trace of sulphur. It yields splendid illuminating gas.

For locomotive use these coals must rank among the very best. The coke is the most firm and persistent of any I have ever seen.

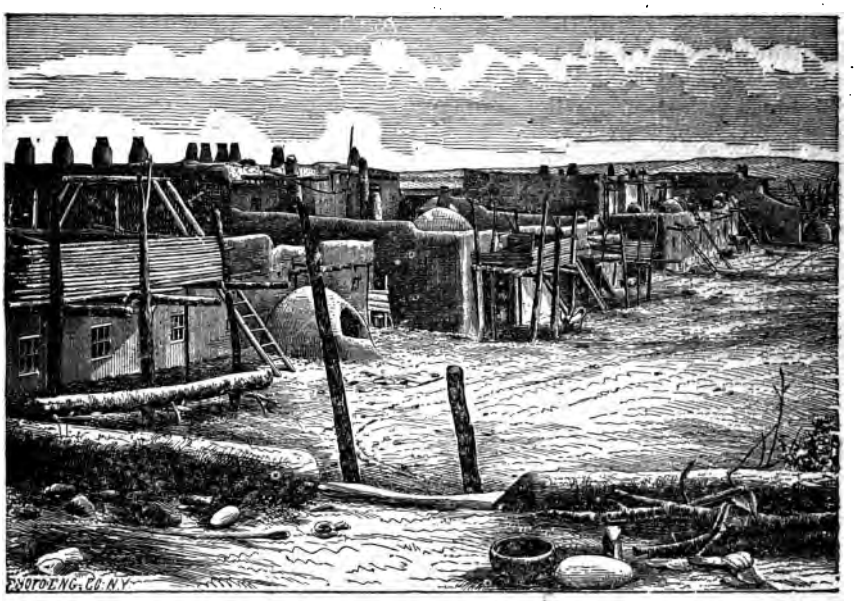
J. H. SEWELL, M. D.,
Analytical Chemist, Illinois State University.'"

Professor Wilbur adds:

"It would seem that nothing more could be said setting forth the quality of New Mexico and Trinidad coals."

The following analysis also, has reference to Colfax coal, and was made from specimens taken near its surface, by Frank E. Nipher, Professor of Physic and Chemistry in the Washington University of St. Louis:

Fuel—100	Specific Gravity.	Lbs. Av. Cub. Ft.	Moisture.	Ash.	Color of Ash.	Coke.	Total Volatile
Top.	1,345	84.0	2 0	9.3	Brown.	60.9	39.1
Middle.	1,368	85.4	3.1	10.4	Pink.	61.9	38.1
Bottom.	1,388	86.7	2.6	15.6	White.	63.1	36.9
Average.	1,367	85.36	2.57	11.76		61.96	38.03



TEZUQUE PUEBLO, LOOKING WEST

PROGRESS OF MINING INDUSTRY.

A REVIEW OF THE MINING OPERATIONS IN NEW MEXICO, IN THE YEAR 1882, BY CHAS. W. GREENE, A COMMISSIONER.

Looking back over the year just closed, we find a marked progress in development of mining industry of this Territory. At the beginning of the year almost everything that could be said of it was of its prosperity in the distant past, or of its hope for the future under the new regime just inaugurated. The practical questions were often asked: "Where is the product of the mines, for which so much is promised?" "Why no output from the large number of mines you tell us about?" Save the operations at Georgetown, Santa Rita and Silver City, and for a brief period at Socorro; there was no real mine production, and but little practical mining. Smelters were talked about, and mills, in several parts of the Territory. One had been built and was standing idle at Cerillos; another, the Duryea, had proved a failure at Bonanza City; another had been built and was making spasmodic efforts to obtain ore at Socorro; another novel electric process was about being tried at White Oaks; a small mill had been built at the same place, but had not been successfully operated. Prospects by thousands, had been located and recorded; upon some of them two or three assessments had been worked; on much the larger portion only one assessment, if any, had been worked. Mines, in the full sense of the word, were very few and far between. To one who has watched the changes of the year, there has been much to encourage and but little to disappoint. The advance has been steady; there have been but few failures, and where either labor or capital has been employed it has generally yielded gratifying results.

I purpose in the present article to take the counties consecutively and make a brief review of the present situation, as compared with that of one year ago. There is no accessible record, and necessarily the observation of any one person covering the whole field must be somewhat cursory and imperfect. There is enough, however, at command to make good the assertion that

more has been accomplished within the one year than in all the preceding time since the industry was newly established. In

COLFAX COUNTY,

The northeastern one of the Territory, almost all of the mineral land is within the limits of the Maxwell grant, and comparatively little has been done, except in coal mining near Raton. This is developing into an important interest. The railroad company controls the mines and also monopolizes the coal business within the Territory, taking most of the supply for the entire road from that vicinity. A large number of coke ovens have been put in operation and an excellent quality of coke is finding a ready market in Arizona, as well as New Mexico. Some placer mining for gold is done every year, and I presume the product will not be less than the year previous—about $200,000.

The chief industry of Colfax county is the stock raising, and within the year, every previously unoccupied acre of pasturage has been put into use. Capital to an enormous amount has been invested there, and taken all in all, the year has been a very prosperous one for the county. In

TAOS COUNTY,

In the north center there has been activity and constant work. Good finds have been reported; several companies have been organized, and one of them has erected a Fraser & Chalmers' hoist upon their mine. Many others have been developing their properties with satisfactory results, and it is an established fact that there is an abundance of gold, silver and copper ores, which will pay well for mining and treating, Some excellent coal deposits have been opened out and are coming into local use for steam and domestic purposes.

RIO ARRIBA COUNTY,

In the northwest, most of which is off the railroad, the chief interest at the present time are agriculture and stock raising. That there are large deposits of the precious metals admits of no doubt. It is only because of the greater accessibility of other districts, that it lags in the rear. It is in the immediate line of the eastern mineral belt which traverses Colorado and New Mexico, and the prospects so far located are as promising as those in other portions of the Territory.

BERNALILLO COUNTY,

To the south of Rio Arriba, is coming to the front. The Nacimiento copper mines have, perhaps, recieved most attention, a

company having been actively at work there most of the year. In the Sandias, to the east of Albuquerque, recent discoveries are reported, and in the neighborhood of Jemez Springs copper and galena deposits have been located. During the year a company has been organized at Albuquerque to erect and operate a smelter, of which C. L. Hubbs is manager. He had constructed it at Bonanza City, but failing to get ore as expected, it was removed to Albuquerque. It is a Pacific Water Jacket smelter, and in its new location a special copper furnace has been added. The close of the year found it just about ready to put in operation, with a quantity of ore on hand. The coal mines along the line of the Atlantic & Pacific road are being extensively worked. They cover a large area, and although not generally a coking coal, it is proving an excellent fuel.

SANTA FE COUNTY.

The Cerrillos district has for three years attracted a full share of attention. Much work has been expended on the different properties, and of several it may be fairly claimed that they are mines. The Gonzales concentrator has been completed, but has been operated for only a brief period. The Cerrillos smelter has been in active operation, and successfully, for the past three months, treating ores from Lake Valley and Socorro county, as well as from the local district. At San Pedro the property has been in a dormant condition. The smelter has been in operation occasionally, but without fully satisfactory results. Within the last two months, however, experiments in the treatment of the ore have resulted in finding a method by which the refractory elements can be gotten rid of, and the ore worked profitably. As there is an enormous mass of it, this step, gained just at a time of greatest discouragement, must be considered of great importance. Arrangements are already making for working it on a much larger scale. A new smelter is nearing completion at Bonanza City, and another one is being erected in Santa Fe. The coal fields at the Cerrillos, are being worked but slowly, although the coal is of the finest quality, both of anthracite and bituminous. A thousand tons of anthracite coal have been contracted for at San Pedro, it having been satisfactorily tested there. It is also coming into use at the Pueblo iron works. The railroad tariff has virtually prohibited shipments beyond a few miles. The owners are looking forward hopefully for the completion of the Texas, Santa Fe & Northern railroad, to open a market for them to the north.

SAN MAGUEL COUNTY,

Is chiefly devoted to stock interests. Mineral Hill is about the only organized camp, and a number of miners have found encouragement enough there to work continuously through the year. A rich strike was quite recently reported. There are as yet no reduction works of any kind in the county.

VALENCIA COUNTY

Lies south of Santa Fe and Bernalillo. In the Manzano range there has been quite a number of locations, some of them giving good promise. The chief industry of the county is sheep raising, and although the railroad passes immediately through it, there is less known about it than almost any other in the Territory. It has no newspaper to herald its attractions or to record its progress. South of Valencia is

SOCORRO COUNTY.

The city of Socorro is in the center of an extensive mineral district. The Socorro mountains immediately west, the Magdalenas a few miles beyond, and the Mogollons to the southwest, are all tributary to the city. The Black Range, also to the southwest is asserting its claims to be one of the richest mineral districts yet discovered anywhere, and the pick and blast may be heard in every direction. On the east side of the Rio Grande the Oscuras give rich promise, and the white Oaks district is connected by a daily stage line. The mines in every part of the county are being extensively worked, and a large amount of capital has gone in there during the year. Several properties have changed hands at quite high prices. In the Magdalenas, Colorado parties have purchased the Kelley and are preparing to work it on an extensive scale. A smelter has been running there a portion of the year, passing through the experimental stages. It is in good condition for the coming year's business. Hoisting machinery has been erected at several points; a small mill has been put up for experimental purposes at the Cooney mine in the Mogollons. Other reduction works in the outlying camps are decided upon and will be erected early in the present year. The Torrence mill, at Socorro, has been idle much of the year. The mine was opened and worked upon the vein without proper prospecting, and several months have been devoted to development work, which will put the mine in condition to make a satisfactory production the present season. The smelter at Socorro has never been sufficiently capitalized to operate successfully. It is in good condition, and with proper management will yield satisfactory results.

GRANT COUNTY,

South of Socorro, and the southwest county of the Territory, has more developed property than any other, and until the past year has been the only one yielding anything from lode veins. The past twelve months has witnessed remarkable progress there. The Georgetown mines have been steadily worked, and although the exact figures are not at hand, $300,000 is probably not an overestimate of their production. The Santa Rita property has been extensively worked and many improvements have been made. The stamp mill has been substituted by the Cornish roller and jig system, effecting a great saving of copper. A double drum hoist has been erected and the capacity of the works has been increased to one hundred tons of ore per day. The San Jose Smelting Company is erecting a smelter three miles from the Santa Rita, and are already buying considerable quantities of fine copper ore from the Hanover district adjoining, which is showing up admirably in every direction. At Silver City, Bremen's mill has been in constant operation. The mine has been stocked, and it is probable that it will be worked on a more extended scale before the close of this year. Recently six Frue Vanners have been put in to treat the tailings of which there is a very large accumulation. The Lone Mountain district has been steadily worked during the year, and parties interested there have erected a fine mill at Silver City. A local company is about erecting a smelter at Silver City for the treatment of Cook's Peak ores and for custom work. In the Burro Mountains there have been quite extensive operations. The Bullard Peak district is being rapidly developed and shows fine promise. The Valverde company has expended a large amount of money in the erection of copper smelters, and the accessories to them. They are producing regularly and largely. At Oak Grove another village has been built and copper smelters, are in operation yielding steadily of high grade copper bullion. In the Steeple Rock district, eighty miles west from Silver City, a fine twenty-stamp mill is nearing completion, and one of the most promising true fissure veins in the Territory is being actively developed. At Shakspeare, a smelter has been in operation a small portion of the year producing excellent results. The mines in the vicinity are being actively developed and other reduction works will be established there during the coming spring. At Leitendorf, or Pyramid City, the Viola mine has been extensively developed and a first-class twenty-stamp mill is almost completed. Machinery for reduction works is being erected at Eureka, and active development is in progress at the

Victoria mines, eighteen miles from Deming, by California capitalists. Ground has been purchased for the erection of a smelter at Deming, by the owners of mines in the Florida mountains, a few miles distant. In the northeastern corner of the county, the Kingston or Percha district has been considerably developed during the last half of the year, and the outlook is very bright for the coming season. Some seventy tons of very rich ore have been shipped from the Bullion mine, and there is more in sight. Since the above was written a great strike has been made in the Superior mine, which indicates that there is an immense deposits of high grade ore along a contact extending several miles, with a similarity of croppings for the entire distance.

DONA ANA COUNTY

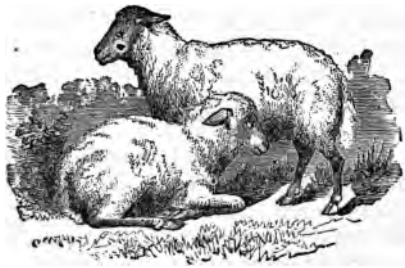
Occupies a central southern position in the Territory. In the northwestern corner is Hillsboro, the seat of considerable mining activity. A ten-stamp mill has been in operation most of the year, to which additions and improvements are being made which will double its productive capacity. The mines are all most promising. A hydraulic company will have expended more than a quarter million dollars before the first of May, when it is expected to have twelve miles of pipe down and arrangements completed for extensive placer washing. Eighteen miles south the famous Lake Valley mines have produced a round million dollars of fine silver bullion, in the past six months, with only a twenty-stamp mill in operation. A thirty-ton smelter is almost ready to blow-in, and a steam hoist has just been erected upon a new working shaft which the company is sinking. The remarkable exhibit made at Denver of the ore from these mines has contributed largely to the rapid influx of people and capital during the fall and winter, very greatly benefiting the entire Territory. A contract has been made for quite extensive prospecting, by drilling of surrounding properties, and the machinery for it is ready on the ground. In the Organ mountains there has been a large amount of development work done, and some very rich discoveries have been made. Considerable ore has been shipped to Socorro, Denver and Pueblo, yielding good returns. At least one company will erect reduction works, the coming spring. In the San Andreas, just north of the Organs, some excellent properties are being opened.

LINCOLN COUNTY,

In the southeast corner of the Territory, is a county larger than many of the states, some of it abounding in mineral. The White Oaks district was the first to be extensively advertised.

Unfortunately it attracted a class of investors who expected immediate and large returns from very small investments. Some very good work has been done however. The machinery which was erected at great cost to work the Homestake ore by an electric process, is being re-arranged and additions made to it, to put it in operation "in the good old way," it is likely to make a good report during the coming year. There has been a steady development of the Nogals; the Bonito; the Jarilla—recently formed—the Jicarillas and other mining districts of the county. A large deposit of excellent coal has been opened and the Texas and Southern Pacific railroads contemplate building a line of road from El Paso to White Oaks, in the early spring, that they may gain access to it.

We have thus briefly sketched the existing conditions of the mining interest in the several counties, and under the circumstances it is not too much to predict that the coming year is to see activity all along the line. Capital is coming in freely, experienced operators are taking hold of the mines, and the product for 1883, will undoubtedly reach to several millions—probably to much more than the aggregate with which New Mexico is credited at the mint, as its entire modern production.



THE PORTAL, TOLTEC GORGE, LOOKING EAST, D. & R. G. RY.

NEW MEXICO'S DISPLAY:

REPORT OF NEW MEXICO'S DISPLAY AT THE NATIONAL MINING AND INDUSTRIAL EXPOSITION, HELD IN DENVER, AUGUST AND SEPTEMBER, 1882.

Prepared for the Bureau of Immigration by Walter C. Hadley, a Commissioner for New Mexico.

New Mexico was among the first Territories to respond to the call made by the managers of the National Mining and Industrial Exposition. In keeping with the acknowledged enterprise of her citizens, the opening day, August 5th, found the duly appointed commissioners from the various sections at their stations in the exposition building, in charge of their exhibits.

There was much that was incomplete in the displays of other Territories, and the mechanics were at work in their spaces for many days and even weeks after the opening, making expensive and gorgeous booths, rendering it impossible to accommodate visitors. It was different with us in our quarters. We understood the object of the exposition to be principally the display of mineral. To add other features, for attraction, appeared a secondary consideration. There has not been therefore, a single hour in the two months when New Mexico's exhibit was not accessible, and always in charge of commissioners who furnished any information desired. It is true, many who have examined it may have noticed that the caskets which held the jewels were not so elaborate as those of the older, producing districts, but the *jewels were there*, and that their merit was not surpassed by that of any others in the building is a fact which no one has ever denied; indeed, we may go farther and say that there was not so continuous a throng of admiring spectators present in any part of the exposition. The Rocky Mountain Mining Review says:

DEEP MINING IN NEW MEXICO, 1680.

"It is doubtless true that no mining state or Territory has been the recipient of greater benefits from the National Exposition than New Mexico. Her fine display has attracted widespread attention which together with the unceasing efforts of her energetic commissioners has combined to bring before the public in a new and startling light the varied attractions possessed by her, especially in a mineral way."

The space allotted the Territory of New Mexico was 1,300 feet square divided as required for the accomodation of the minerals from the various districts. It is simply impossible to do justice to the subject in attempting to describe the minerals in detail, we can merely give the three or four most essential particulars of the ores shown, and demonstrate the facts which

have been especially manifested, that at very shallow depths, and with almost no development, in many instances, the bodies of mineral shown up are of enormous width, and the grades of a large majority of the specimens are unusually high. Following is a brief summary:

DONA ANA COUNTY AND THE BLACK RANGE EXHIBIT.

(*In charge of G. S. Haskell, a Com'r.*)

The Lake Valley district made a showing which far surpassed anything else in the building in the way of rich ores coming from large bodies. The verdict was universal and unequivocal. They were inclosed in three glass cases. In one was a piece of horn silver weighing 640 pounds valued at $7,240. A ton of this ore is worth $22,625.69. Eight men in eight hours took out $130,000 worth of it. One brick of 241 pounds, value $2,169.14, 990 fine was shown which was run from 241 pounds of the ore. This ore is all from the mines of the Sierra Grande company. The output at present is at the rate of about $5,000,000 per annum.

Percha district, where the recent new discovery was made, was represented by one piece of ore weighing 150 pounds, value $1,800, taken from the Solitaire claim, bonded by Gov. Tabor for $100,000. It is a sulphide of silver and native silver, running 69 per cent. in the pure metal. This is probably the largest piece of sulphide of silver ever discovered. A smaller piece of equal richness was exhibited, in which the grass roots were seen.

The Organ district, was represented by about thirty mines, of which we can mention only a few. Copper Duke, eight feet wide, discovered in September, nine feet of development, runs 40 to 60 per cent. in copper and as high as $150,000 gold. This was one of the most remarkable free gold specimens shown.

Memphis, 180 ounces silver, 65 ounces gold, also runs 34 per cent. copper; shaft 200 feet.

Little Buck mine, mills 700 ounces, native, horn silver and black sulphurets.

Short Cut, 140 feet deep, argentiferous galena, black sulphurets.

Davis mine, carbonate and oxides of copper.

Some fine carbonates were shown from the Crescent City and Hidden Treasure. The mines of this district were well represented, but insufficient data accompanied the specimens.

The Black Range specimens attracted especial attention. The following may be mentioned:

Colossal, depth 100 feet; millrun 400 ounces silver at Hill's works, Denver.

Buffum, depth 180 feet; millrun 102 ounces silver; vein four feet.

White Gravel, depth 70 feet; vein eight feet wide; mill test 93 ounces silver.

Dreadnaught, millrun 42 ounces silver, 11 per cent. copper; depth 34 feet; width of pay four feet; vein six feet.

Sailor Boy; 100 feet development; $110 gold and silver; 20 per cent. lead, 18 copper; vein six feet; pay three feet.

Rifleshot; depth 85 feet; blanket deposit 25 feet in thickness; millrun $110 at Hill's works.

Wall Street No. 2, millrun 453 ounces silver; mineral 22 inches wide; vein 4 feet.

Mountain Chief, depth 88 feet, three feet of mineral. Forty assays ran from 11 to 7,928 ounces silver.

Montezuma, 148 feet shaft; 150 ounces silver, 1 ounce gold, pay streak one to four feet.

Alaska, depth of shaft 209 feet; assays 50 to 125 ounces; width of mineral five feet.

Great Republic, four feet of mineral; assays 50 to 4000 ounces silver, and one to 100 ounces gold.

Ivanhoe, 400 feet deep; assays 50 to 12,000 ounces silver; two to 2,000 ounces gold; two to six feet of pay mineral.

Occidental, 220 feet deep; width of mineral three feet; assays two to 400 ounces silver, one to 20 ounces gold.

GRANT COUNTY EXHIBIT.

(*In charge of Alex. McGregor, a Com'r.*)

Silver City district, represented by the '76, Sherman, Old Timer and Providentia mines; all of which are of the same character of ore. The former has a vein three to 15 feet wide carrying spar with chlorides to the amount of over $100 to the ton. Between 3000 and 4000 feet of development has been done on the '76. Providentia ore is somewhat higher grade.

Pinos Altos furnished excellent gold quartz specimens.

Georgetown district, sent some very fine specimens.

Naiad Queen, three to 15 feet vein; 500 feet deep; millrun 100 ounces silver; quartz ore.

Commercial, same ore and width of vein as Naiad Queen; millrun 140 ounces silver; depth 180 feet.

McGregor mine, same character of ore and same width of vein as the Naiad Queen. Depth of workings 250 feet, average millrun 152 ounces silver.

Satisfaction, 115 feet deep; millrun 340 ounces silver.

The Santa Rita district sent specimens of red oxides and native copper, the large sheet of the latter from the Romero mine

being especially remarkable. Large specimens of copper carbonates taken from the surface in various parts of this county, were on exhibition.

Chlorides and native silver ores from the Black Hall and Blue Bell mines in the Burro's running from 2,000 to 12,000 ounces silver.

LINCOLN COUNTY EXHIBIT.

(*In charge of W. C. McDonald, a Com'r.*)

The White Mountains have been little explored, but the specimens give evidence of great wealth in that part. They are from claims that are on the ground recently thrown open by the changing of the lines of the Mescalero reservation.

Red Chief, eight foot vein; gangue spar; averages 50 ounces silver.

Flower Pot, four foot vein; copper glance; assays $37.00 silver, 20 per cent copper.

Copperhead, 10 foot shaft only; a new discovery; three foot vein, grey copper; quartz and carbonate of copper; $17.00 silver, 27 per cent. copper.

Blue Stone, is an azurite; $150 to $200 ounces silver, three foot vein.

Minnie Lee, two feet wide; $59.00 silver and 50 per cent. lead.

Center Crickett, quartzite; $230 to $600 gold; width five and a half feet, depth of shaft 65 feet.

Santa Ana, six foot vein of quartz; $300 in silver; 12 foot shaft.

Neptune, decomposed quartz, vein six feet wide on surface; 10 pounds of the ore assayed $200 to the ton.

Mazeppa, lead carbonate; width of vein five feet; pay streak 14 inches; 169 ounces of silver.

Accident, four feet pay; ore carbonate and galena; 111 ounces silver.

Oreland, 100 feet deep; four and a half feet wide; galena, quartzite; 64 ounces silver, 10 to 20 ounces gold.

Christmas, has two crevices eight feet apart, one three feet wide, 100 to 2,500 ounces silver; other crevice four feet wide, 50 to 500 ounces silver; lead carbonate and galena.

High Line Chief, gold quartz; $38 to $130.

White Oaks district was represented by some of the finest specimens of free gold there were in the exposition, taken from the Little Mac, Homestake, Old Abe, Henry Clay, and others. The gangue is a quartz trachyte carrying the gold in wires and also in flour form. The veins are from four feet up in width and

a mill is all that is needed to take out enormous values at once. Recent discoveries of excellent bituminous and semi-bituminous coal from White Oaks, were displayed. The veins from which they were taken being five feet in thickness. Iron from 40 foot vein within five miles of the coal beds was also shown.

The Gallinas Mountains furnished some fine specimens of grey copper from the Tenderfoot mine, which carries chlorides of silver, assaying as high at $3,600.

SANTA FE COUNTY—LOS CERRILLOS DISTRICT.

(*In charge of Cyrus Wells, a Com'r.*)

The anthracite coal was by no means the least important feature of this display. Among the prominent ores we mention:

Cash Entry, carbonate of copper; pay streak 12 inches; 20 tons of this ore sold for $12,500 this month.

Mina del Tiro, the old Spanish mine; quartz and galena; runs about $40 in silver.

Nick of Time, argentiferous galena; 350 feet deep; four feet of mineral; 40 per cent. lead; $30 in silver.

Orphan Boy; 50 per cent. lead; $50 to $60 in silver; two feet pay streak.

Marshall Bonanza, mills $100 to the ton; five feet pay streak; 200 feet deep.

Bonanza No. 3, 300 feet deep; galena ore, running more than $100 in silver and 50 per cent. lead.

Chester, carbonate of lead; $2,500 per ton; 12 inch vein.

Bottom Dollar, 100 feet depth; good pay; silver ore with 25 per cent. lead.

Great Western, 300 feet shaft; four feet of mineral; 50 per cent. lead; $150 to $200 in silver.

Duchy, 110 feet deep; two feet of mineral; 45 per cent. lead, showing also antimonial silver.

Captain, carbonate of lead; $100 in silver.

Aztec, 120 feet shaft; $200 silver; 20 per cent. lead.

Grand Review, 175 feet deep; four feet ledge; 20 per cent. lead; $140 silver.

Rey del Monte, two shafts, 30 feet each; carbonate of copper; $150 silver.

SOCORRO COUNTY EXHIBIT.

(*In charge of D. T. Beeler, a Com'r.*)

The Mogollons were represented by several fine specimens, the most prominent among which were those from the Cooney mine, a copper carbonate carrying $400 silver, $40 gold; 30 per

cent. copper; vein four feet wide; considerable development done and work being vigorously prosecuted.

In Water Cañon the following were especially noted.

Juniper, galena and carbonate of lead; mills over $100 silver; 25 feet shaft. vein six feet wide.

Nellie B, $180 gold, $20 silver in a gangue of magnetic iron. Forty tons of ore taken from seven feet in the shaft.

Silver King, 12 inch vein; galena and iron; millrun $175 to the ton; has 40 feet tunnel.

Summit Queen, vein 100 feet wide, with three crevices. First, carbonate of copper; $600 in silver. Second, galena; $55 silver; 50 per cent. lead. Third, spar and quartz, carrying chlorides worth over $100 to the ton.

Copper Chief, 100 pounds returned in millrun at the rate of $7,000 to the ton.

Star of the East, 35 feet shaft on a 20 feet vein, carrying as high as $100 in silver.

Two Deuces has only slight development. Ore assays $700 silver, $20 gold, 20 per cent. copper and 4 per cent. nickel.

Ninevah Copper mine, has 100 feet of development; 50 feet vein; pay streak runs $40 gold, $20 silver, and 60 per cent. copper.

The Socorro Mountain was represented by only three mines, Torrence, San Diego and San Juan. The ore of all these is similar, being a sulphate of baryta gangue. The Torrence mine is being extensively worked, and the output is treated at the mill in Socorro. The lowest grade ore turned out mills $17.

Among Magdalena specimens, we may mention the following:

From the Kelly, Juanita and Graphic mines, all located on the same vein, were displayed magnificent specimens of argentifeous galena and carbonates. This vein is from two to ten feet in width in various parts where it has been opened. Ore runs from 30 to 75 per cent. lead and 60 to 100 ounces in silver. Depth of 100 feet reached on the Kelly mine and nearly the same depth in the Juanita. The Slaven and Stonewall Jackson are ore veins heavy in lead, running about 60 per cent. Ore runs from $35 to $115 silver and $50 in gold.

Pueblo, 18 inch vein; malachite and flint gangue; assays $7,000 silver, $85 gold, has a 22 feet shaft on it.

The Imperial is 30 feet wide; a galena, copper carbonate, and quartz. Shaft 112 feet deep in ore running 30 to 100 ounces silver; $30 to $40 gold, and 20 to 75 per cent. lead.

TAOS COUNTY.

It is remarkable that no more development may be chronicled in Taos county, lying as it does in the norther portion of the Territory. It would naturally be supposed that enough of good prospectors and competent miners would have found their way over the Colorado line and opened up the immense mineral resources of this part very largely, but it appears that the Colorado miners, when they move, are inclined to make a long journey rather than a short one. This idea is not a new one, at this time, but we have for a long time found it the only basis of explanation of the fact that Taos, Colfax, Rio Arriba, and San Miguel counties are so little explored.

The specimens shown were few in number, but really of good character, and such as should draw to that part plenty of capital to develop the lodes from which they came. Good iron and quartz gold rock was shown from the Rio Hondo, and in this same district are extensive placer fields.

Dr. D. W. Bliss, of Washington, associated with Col. S. N. Hoyt, of Taos, is interested in some promising mines here. Specimens were not shown, but both gentlemen were in Denver during the exposition, to purchase machinery for immediate use.

Copper Hill district sent some fine specimens of red oxide and carbonate of copper with quartz, which assay from 30 to 60 ounces silver.

The Arroya Hondo district may claim greater progress than any other. Specimens of good solid argentiferous galena were shown from the Dora Newell, a property having a vein two to eight feet wide, owned by Baltimore parties. A millrun two months since at Pueblo, of 2,200 pounds, returned 140 ounces silver and 50 per cent. lead. Work is being prosecuted vigorously on this mine.

The Arroyo Hondo mining company is composed of several Territorial officers, including Gov. Sheldon. Specimens of galena, associate with white iron in a quartz gangue, carrying about $30 in silver, were sent from the Bulwark mine, belonging to the company.

Ores were also exhibited from the Picuris mine, that assay from 14 to 135 ounces in silver.

SANTA FE COUNTY—ADDITIONAL.

(*Reported by Hon. W. B. Sloan, Commissioner in charge.*)

The minerals of this county which were on exhibition at the Denver exposition, were very fine, mainly high grade, and became the subject of much favorable comment. The following

mines were represented in the Santa Fe county collection, sent by the Santa Fe Board of Trade.

The Placer Mining District:—the Era Southwestern mine had one sack of ore taken from a five foot vein about 15 feet from the surface; average assay $60 per ton, containing silver, copper and gold.

The John Perry had one sack of ore taken from a four foot vein, similar ore as the Era Southwestern.

The San Francisco contains sulphide of copper, running 22 per cent. copper and $18 in gold and silver.

The Emerald, containing copper carbonate; four and a half foot vein; 20 feet from the surface; assays show two and three fourths ounces gold; 12 per cent. copper.

The Emporia, argentiferous ore, two and a half foot vein, 30 feet from the surface; assays 38 ounces silver, two ounces gold.

The Netta has a vein of galena, 20 inches wide; assays $40 in silver, 22 per cent. lead.

The Maud S, has a two foot vein of fine ore; assay not given.

The San Pedro mine, this ore is a copper carbonate of exceptional beauty, with a percentage of about 48 in copper and is claimed $18 in gold.

The Avondale contains galena and horn silver and at 50 feet depth assays 1818 ounces silver.

The Alpine is a carbonate, yielding $20 in gold, the percentage of copper not being given.

The Lucky contains argentiferous galena, the assay being 75 per cent. lead, and 85 ounces silver.

The Alamo contains argentiferous galena, from a three feet vein, at a depth of three feet; lead 50 per cent.; silver $97.

There were also some fine specimens on exhibition from the Aztec, Great Western, Lady Washington, Bottom Dollar, Pride of Erin, Dutchie, Chromo, Cactus, Little Pittsburg No. 2, Handa Anda, Cuckoo, Bertie, Crescent, Mina del Tiro, Col. Marsh, Gen. Moore, Michigan Boy, Sleeping Beauty, Old Discovery, Cortes, Rockingham, Pacific Mine, Hub, Captain, Black Warrior, Our Lode, Golden Eagle, Helen, Sitting Bull, Melvina, Rey del Monte, Franklin, South Altoona, P. B. Pearce, Washoe, Grand Prize, Nick of Time, Orphan Boy, Cash Entry, Grand Review, Zulu Chief, Chester, Clara, Mexican Prince, Cañon del Agua, Marshall Bonanza, Bonanza No. 1, and Bonanza No. 2. These mines were mostly represented in the Cerrillos cabinet, in charge of Cyrus Wells Esq., and of which a detailed account has been given by Mr. Walter C. Hadley.

Of these the gold ores are free milling quartz, of fair average grade, and the same may be said of the silver bearing ores,

with this addition, that the major portion were argentiferous galena, and were remarkable for the absence of antimony.

The copper ores consisted of carbonates, oxides and sulphides, and are exceptionally fine, in fact the sulphides had no equal in the whole exposition. The chalcopyrites and bromites from the Placer district are beauties, and veryattractive; their chrystalization is peculiar, and there was nothing else like it in the building.

Placer dirt from both the Old and New Placers, was rich in gold; the composition is peculiar to itself, the gold from its bright appearance shows it could not have traveled far from the source of supply.

The Coal on exhibition, both anthracite and bituminous, (See reports on coals of New Mexico), was of exceptional quality, and specimens of the anthracite were in great demand, of which many went east, and in three instances to England, and one to France, and one to an American lady visitor from Hong Kong, China.

The cabinet of minerals which has been collected and named the "Mining News Minature Cabinet," of the entire Territory, was collected by the writer, while connected with the Daily New Mexican and Mining News, of Santa Fe, and taken by him to the Denver Exposition. This exhibit was intended, as it did in fact, to represent each district then known in the Territory, and for that reason was observed and very much admired. It also contained some rare specimens of both the upper and lower silurian epochs. This cabinet is without any doubt, an exceptionally rare and costly one, and can now be found in the office of the secretary of the Board of Trade, at Santa Fe, where it is open to visitors at any time.